IMPROVING EDUCATIONAL QUALITY PROJECT (IEQ)
SOUTH AFRICA

An Impact Evaluation of the Educational Support Services Trust's (ESST) English Proficiency Programme

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Preface

The IEQ Project's Approach to Programme Evaluation

Most grantees' encounters with programme evaluators consist of feeling under threat, interference with service delivery and impositions on staff time. These negative experiences emerge because donors' usually insist that evaluations be conducted by "outsiders"/ external evaluators. Also, external evaluators usually do not make it a point to be of assistance to the programme and often, the programme staff have little confidence in the evaluation process that they are not always willing to co-operate with the evaluator. However, the IEQ Project's approach to working with grantees in introducing and implementing evaluation methodologies differs from previous experiences in that the IEQ develops collaborative relationships with grantees that involve:

- identifying grantee information needs which may be gathered during the assessment;
- working together to construct a design that fulfils grantee information needs;
- forming teams of IEQ and grantee staff to develop data collection instruments that remain with the grantees for project use;
- building capacity to sustain monitoring and evaluation activities;
- conducting site visits together and
- developing strategies for utilisation of the findings to influence policy and improve practice.

Goals of the IEQ Project

The following goals have been articulated for the IEQ Project in South Africa:

1. Conduct impact assessments of grantees' products and services that influence instruction and learning at the school and classroom level.
2. Strengthen grantees' capacity to establish and maintain monitoring and evaluation systems of individual projects
3. Strengthen grantees' expertise in educational research and evlauation methodology
4. Facilitate professional linkages between grantees and the educational research and development community within and outside South Africa

To this end, the IEQ team members and consultants have worked together on this evaluation.

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List of Acronyms

EPP	English Proficiency Programme
ESST	The Educational Support Services Trust
IEQ	The Improving Educational Quality (Project)
NGO	Non-Governmental Organisation
USAID	United States Agency for International Development

Executive Summary

INTRODUCTION

There is a pressing need for cost-effective, skills-based learning materials in South Africa. Non-governmental organisations (NGOs) like The Educational Support Services Trust (ESST) have programmes such as the English Proficiency Programme that focus on the creation of resource-rich learning environments that enhance the learning of certain cognitive skills. The potential exists for using models such as these in addressing the great need for enhancing the quality of primary education on a larger scale.

This report presents the findings of an Impact Evaluation conducted collaboratively by the Improving Educational Quality (IEQ) Project and ESST. The purpose of the study was to examine the impact of the use of materials on learner performance provided by the English Proficiency Programme (EPP). The evaluation was at the behest of ESST in fulfilment of a United States Agency for International Development (USAID) grant requirement.

THE EDUCATIONAL SUPPORT SERVICES TRUST

The Educational Support Services Trust (ESST) is a non-governmental organisation (NGO) that provides a variety of services in the formal and non-formal sectors of education in various parts of South Africa. Specific educational needs of educators and learners are met by programmes such as the English Proficiency Programme (EPP), the Primary School Mathematics Programme, the Matriculation Support Programme and the Family Education Programme. The broader community is served by a variety of publications which cover topics such as skills training, financial management, voter education and health.

The EPP focuses on the provision of appropriate resources to predominantly disadvantaged pupils in rural and township primary schools.

Programme Description

The English Proficiency Programme provides a model of intervention which constitutes learners being involved with any subject matter whilst simultaneously learning English and thinking skills, and the teacher facilitating this process. Learners are supplied with six learning books and six newsletters during the course of the school year. English is used as the mediation tool through which learners are stimulated to respond creatively to problems rather than seek externally offered solutions. The materials consist of a variety of problem-solving activities which include stories, mathematical fun and the wonderful world of science and technology. Through the materials, learners are afforded the opportunity to interact with information and mental operations, such as literacy, numeracy and problem-solving in a fun-filled manner. The teacher pays a critical role in facilitating a learning-centred environment in which there is on-going interaction among learner, teacher and materials.

The programme's goals include the following:

1. developing the child's competency in English in a spontaneous and natural way;
2. impacting spontaneously on the child's imagination and creativity;
3. exposing the child to all facets of the school syllabus without specifically referring to the subjects by name; and
4. improving the methods for problem-solving by exposing the child to contextualised thinking and problem-solving activities.

PURPOSE

The purpose of the evaluation was to examine whether there is any association between the use of English Proficiency Programme (EPP) materials and growth in language and thinking skills of learners. The evaluation was undertaken by the IEQ Project in collaboration with ESST's EPP team. This evaluation had the added purpose of building the capacity of the NGO staff to systematically monitor and evaluate their own programmes. Through a collaborative approach to evaluation, the EPP staff worked closely with the IEQ team in designing and conducting the evaluation and in planning for the utilisation of the results. Results have the potential of affecting change not only in terms of programme improvement and showcasing results to potential donors, but also to pointing to a model for enhancing the quality of primary education at large.

EVALUATION QUESTIONS

The evaluation examined questions related to the impact of the use of EPP on learner performance:

1. In what ways do the achievement scores of Standard 4 pupils who use EPP materials differ from those who do not, in terms of English Proficiency, Problem-Solving and Graphicacy?
2. What are the effects of the interaction of time and region, and time and gender on the achievement scores in English Proficiency, Problem-Solving and Graphicacy of Standard 4 pupils who use the EPP materials?

DESIGN

Collaboration between IEQ and ESST

The EPP staff worked with the IEQ team in designing and carrying out the evaluation. Throughout the process, collaboration, capacity building and mutual learning were emphasised and responsibilities delineated for all participants. The EPP co-ordinator served as a contact person and worked in collaboration with the IEQ team in designing the evaluation, developing instruments based on the programme objectives, collecting data, interpreting the results and planning for utilisation of the results.

Sample

The primary source of information for the study were achievement scores of pupils who had received EPP materials. A total of 200 pupils from six primary schools in two regions of the Western Cape Province (Khayelitsha and the West Coast) and one region in the Eastern Cape Province were randomly selected by ESST to participate in the impact evaluation. The sample consisted of 96 pupils who had received the materials and 104 pupils who had never received the materials. Two standard 4 classes from two different schools in each of the three regions were selected, a total of six classes. One of the classes in each pair consisted of pupils who have received the EPP materials for one, two or three years (ESST), and pupils in the other class have never received any EPP materials (non-ESST).

Overall, there were 102 girls and 98 boys in the sample. In the ESST classes, 57% were girls compared to 43% boys whereas in the non-ESST classes there were 45% girls and 55% boys. The ages of both ESST and non-ESST pupils range between 10 and 16 years. The overall mean age of both ESST and non-ESST pupils is 12.7 years.

English is not the first language of the pupils in all the regions. In Khayelitsha (Western Cape) and Kwazhakhele (Eastern Cape) isiXhosa is the pupils' home-language while in the

West Coast, Afrikaans is the home-language. English is invariably only spoken at school and more specifically only during the English lesson.

Instrumentation

To address the evaluation questions, the EPP programme co-ordinator worked with the IEQ team members to identify intended EPP programme outcomes for pupils (English fluency, logical thinking, graphic perception, etc.). Two separate sets of worksheets, one for each phase of data collection, were developed. Each set consists of four worksheets which measure the same performance areas, viz. English Proficiency, Problem-Solving and Graphicacy. Worksheets were scored according to criteria which were developed collaboratively by the IEQ and ESST teams. The focus on pupils is important, since enhancing pupil learning is the primary goal of education.

Data Collection

Data were collected by the EPP facilitators in two phases. Phase I data were collected in February-March 1995 and Phase II in October 1995. During the two data collection phases, teachers' of ESST pupils' attended pilot phase Teacher Methodology workshops which form an integral component of the EPP. Phase I scores provide baseline data for the study while Phase II data would reflect whether teacher facilitation in the use of the materials, among other factors, such as maturation, made a difference in pupils' scores over time by region and by gender.

Data Analysis

The data was analysed using a variety of descriptive and inferential statistics, including means, standard deviations, frequency counts and multi-variate analysis of variance with repeated measures. The descriptive and inferential statistics were done primarily using SPSS (Statistical Package for the Social Sciences).

MAIN FINDINGS AND CONCLUSIONS

It would appear that, overall, the ESST English Proficiency Programme is making an important difference in enhancing learning. ESST pupils made gains in all three performance areas that were measured in this study.

The following is a list of more specific findings and conclusions:

1. In terms of **English Proficiency**, it was found that ESST pupils achieved significantly higher scores than non-ESST pupils by time and by region. This finding suggests that the use of the EPP materials together with teacher facilitation is likely to be associated with improved English Proficiency, in varying degrees by region, of the ESST pupils. The findings on the interaction of time and gender on the pupils' English Proficiency show that ESST girls and boys do not achieve significantly different scores. This finding suggests that the EPP materials have similar effects on all the Standard 4 pupils that used them, irrespective of gender. Thus, it can be concluded that the EPP materials have had a positive effect on ESST pupils' English Proficiency scores by region, albeit in varying degrees. Furthermore, it can be concluded that the EPP materials do not have differential effects by gender.

2. A gain in the **Problem Solving** scores of ESST pupils was anticipated in each of the three regions because one of the goals of the EPP materials is to improve cognitive skills using English as the mediation tool. Over time ESST pupils made significantly greater gains

compared to non-ESST pupils. This improvement in the ESST pupils' Problem Solving scores can be associated with the use of EPP materials. ESST pupils did not make the same degrees of gains in their Problem Solving skills from one region to another. Both ESST and non-ESST girls and boys improved their Problem Solving scores with ESST pupils making greater gains. However, the gains made by the ESST pupils are not related to gender. This implies that the manner in which the EPP materials may have contributed to the improvement of Problem Solving skills do not affect girls and boys differently. It can be concluded that the EPP materials have had a positive impact on the ESST pupils' Problem Solving scores over time and by region. The findings on the interaction between ESST and non-ESST by time and gender show that the materials do not differentiate by gender.

3. **Graphicacy** measures the extent to which pupils have developed spatial orientation skills and how they interpreted and represented visual images. The findings show that initially there were no differences between ESST and non-ESST pupils in terms of "reading" and responding to pictures. ESST pupils made greater gains in their Graphicacy compared to non-ESST pupils over time and by region. The finding of the interaction of time and region on Graphicacy scores seems to indicate that there is an association, at varying degrees, between interacting with graphic materials and the development of graphic perception and expression. The finding on the interaction of time and gender between ESST and non-ESST pupils indicates that the interaction is not significant. This signifies that the materials do not differentiate by gender. Thus, it can be concluded that the EPP materials have had a positive effect on ESST pupils' Graphicacy scores by region, albeit in varying degrees. Furthermore, it can be concluded that the EPP materials do not have differential effects by gender.

UTILISATION OF FINDINGS

Programme Development

1. The findings that relate to differences between ESST and non-ESST pupils in terms of English Proficiency, Problem Solving and Graphicacy by time and by the interaction of time and gender highlight the positive effects of the EPP materials. ESST needs to continue to emphasise these performance areas in their programme.

2. The results for each performance area by the interaction of time and region imply that the EPP materials were applied differently by regions. The results raise the question about whether, and to what extent, geographical proximity of the schools to ESST may account for the materials being applied at varying degrees. ESST may consider reviewing the structure and frequency of follow-up visits by EPP facilitators to participating schools. ESST should be more specific to facilitators about what the classroom monitoring and support visits entail.

3. ESST should address the question about what it means to be participating in the Teacher Methodology Project. This is important because if the teacher is to play a critical role in facilitating a learning-centred environment then the Teacher Methodology Project, as a component of the EPP, needs to be clearly defined.

4. ESST facilitators who work with teachers on an on-going basis can use the results of the impact assessment to target their work with teachers.

Institutionalisation

1. ESST should consider identifying other measurable goals of the programme and develop learner worksheets, in collaboration with the teachers with whom they work, that are appropriate across the curriculum. The worksheets used in this study can be revised as needed and other dimensions added to fit these changing needs.

2. Worksheets can be administered by both the teachers and EPP facilitators to monitor and evaluate the programme on an on-going basis. This would provide a systematic internal monitoring system for programme improvement.

Policy

1. The English Proficiency Programme, as an alternative pedagogical philosophy, has shown to be very successful in terms of improving English language- Problem-Solving- and Graphicacy skills of this sample of pupils. ESST strategies to improve educational quality should address the provision of relevant and stimulating resources to achieve goals such as these. Investing in and/or forming partnerships with organisations such as ESST has the potential to greatly improve language and thinking skills of pupils in predominantly disadvantaged schools.

2. The EPP materials and the Teachers' Methodology Project are relevant in diverse contexts and it is from this perspective that the programme has the potential to be delivered in all the provinces of South Africa.

3. The EPP team has the expertise, capacity, and experience to contribute to policy formulation for primary education in areas such as curriculum -, teacher - and materials development and holistic assessment strategies.

Further Studies

1. Are the skills acquired by pupils who use EPP materials maintained throughout primary school?

2. Are the skills acquired by pupils who use EPP materials transferred to secondary school?

3. To what extent do teachers' facilitation skills in creating learning-centred environments and using the materials impact on pupils' performance?

4. Do monitoring and follow-up visits add value to the implementation of the English Proficiency Programme at the classroom level?

An Impact Evaluation of the Educational Support Services Trust's English Proficiency Programme

Introduction

This report presents the findings of an Impact Evaluation conducted collaboratively by the Improving Educational Quality (IEQ) Project and the Educational Services and Support Trust (ESST), a non-governmental organisation (NGO), which operates in the Western Cape-, Eastern Cape-, Northern Cape- and the Northern Provinces. The purpose of the study is to examine whether there is an association between the use of English Proficiency Programme (EPP) materials and growth in language and thinking skills. The evaluation is at the behest of ESST in fulfilment of a United States Agency for International Development (USAID) grant requirement.

The idea of monitoring and evaluating an educational programme is daunting. Evaluations are often viewed as being burdensome on staff and potentially damaging to a programme if the "right" results are not produced. However, educators at all levels acknowledge the importance of knowing whether programmes that strive to either improve learner academic performance or strengthen instructional practices do achieve their objectives. As debates on educational reform at the national and provincial levels occur, and the need to provide quality education increases, the necessity for reliable information is growing.

The report begins with a brief exposition of the context of the evaluation of ESST's English Proficiency Programme (EPP) and the IEQ Project's approach to programme evaluation. This is followed by an overview of the English Proficiency Programme, rationale for the study, evaluation questions, the design of the study and data collection and analysis methods. The findings of the study are then presented and discussed and conclusions and implications are highlighted. A series of appendices which contain additional information appears at the end of the report.

Background

Overview of the Programme

The Educational Support Services Trust (ESST) is a non-governmental organisation that provides a variety of services in the formal and non-formal sectors of education in South Africa. The English Proficiency Programme (EPP) was informally initiated in 1986 with the purpose of developing a resource-based, peer-group learning environment for disadvantaged pupils. The model of intervention constitutes learners being involved with any subject matter whilst simultaneously learning English and thinking skills. The EPP has expanded, and now reaches 70 000 pupils in the Western Cape Province, the West Coast and the Eastern Province. The Education department of the Northern Cape Province has recently bought into the programme and 65 000 Standard 2, 3 and 4 pupils are using the EPP materials.

The English Proficiency Programme focuses on the provision of appropriate learning resources to pupils between the ages of seven and 14 in predominantly educationally deprived areas. Pupils are supplied with six learning books and six newsletters during the course of the school year. The content of the books and newsletters is relevant across the school curriculum and is presented in a kaleidoscope of graphics and texts to which pupils can relate. A vast range of subject matter is included without reference being made to any specific subject by name. The materials consist of a variety of problem-solving activities which include stories and rhymes, mathematical fun, the wonderful world of science and technology, caring for the earth and its creatures, and social issues such as understanding relationships.[1] ESST encourages learners to share the experiences gained from using the EPP materials with family members so that the home and the school are linked to form one integrated environment of learning.

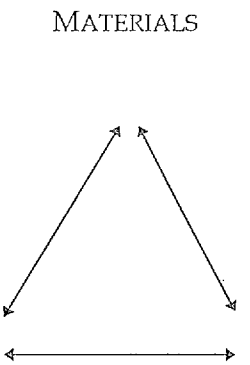
In the books and newsletters, English is used as the mediation tool through which learners are stimulated to respond creatively to problems rather than seek externally offered solutions. Learners are afforded the opportunity to interact with information and mental operations, such as literacy and numeracy, situational analysis, problem solving, graphical expression, spatial distinctions, etc. in a fun-filled manner. Although the pupil is the unit of

[1] Appendix B contains examples of EPP materials

change, the teacher can play a critical role in facilitating learning-centred environment. In effect, the EPP gives substance to the concept of learning-centredness as opposed to learner-centredness. It is for this purpose that the Teacher Methodology Project, an integral part of the English Proficiency Programme, was piloted in 1995.

The Teacher Methodology Project focuses on a question-based, interactive teaching methodology. The nature of the methodological intervention is to change teachers' role from that of disseminators of information to becoming managers of positive learning environments. Teachers are trained to become facilitators who ask questions, debate with the learners and assist pupils to engage with the materials in a meaningful way so that the information and/or skills are internalised by the pupils.

ESST espouses that these changes can only take place if classrooms are resource-rich environments and therefore provides the input to establish such an environment. It is believed that the EPP materials help to create an environment which allows pupils and teachers to interact as a unit. The figure below portrays the interaction between materials, teachers and pupils.



Main Objectives of the Programme

The main objectives of the programme are to:

- develop the child's competency in English in a spontaneous and natural way;
- impact spontaneously on the child's imagination and creativity;
- expose the child to all facets of the school syllabus without specifically referring to subjects by name;
- improve methods for problem-solving by exposing the child to contextualised thinking and problem-solving activities.

Intended Outcomes of the Programme

The following are intended outcomes of the English Proficiency Programme:

- English Proficiency:
  - fluency in English
  - English language usage
  - reading English
  - writing English

- Problem Solving Skills:
  - identification of problems
  - understanding rules
  - logical thinking including comparing, contrasting, sequencing, predicting and drawing conclusions

- Graphicacy:
  - graphic perception
  - graphic expression
  - originality
  - eye-hand co-ordination
  - creativity

Purpose of the Evaluation

The evaluation examines whether there is any association between the use of English Proficiency Programme (EPP) materials and growth in language and thinking skills of learners. The EPP has not previously been formally evaluated although the programme has been monitored by programme staff on an on-going and informal basis since its inception. Much of the evidence of the programme's impact is anecdotal, thus there is a need for a formal evaluation report. In this study, pupils are directly assessed according to identified performance areas and criteria. This method of assessment differs from "traditional" pupil assessments because both subject matter and cognitive skills are assessed.

The purpose of the evaluation is to measure the impact of the use of EPP materials by pupils over a period of one school year (1995) during which the Teachers' Methodology Project was piloted. In this evaluation, impact means the degree to which the use of EPP materials is related to cognitive changes. The knowledge gained from this study will be useful in showing impact to potential donors and departments of education, and programme co-ordinators to inform and guide decision-making related to their efforts to enhance learning. There is also a formative dimension to this evaluation in that it provides information on programme development.

Evaluation Questions

The study addresses the following questions:

1. In what ways do the achievement scores of Standard 4 pupils who use EPP materials differ from those who do not, in terms of English Proficiency, Problem Solving and Graphicacy over time ?

2. What are the effects of the interaction of time and region , and time and gender on the achievement scores in English Proficiency, Problem Solving and Graphicacy of Std. 4 pupils who use the EPP materials?

Design

Collaboration between IEQ and ESST

The ESST director, programme co-ordinator/researcher and facilitators worked in collaboration with the IEQ Project in designing and conducting the evaluation. Collaboration, capacity building and mutual learning were emphasised and responsibilities delineated for all participants. The design of the impact evaluation was finalised by the IEQ in collaboration with the ESST.

Sample

A total of 200 Standard 4 pupils from six primary schools in two regions of the Western Cape Province (Khayelitsha and the West Coast) and one region in the Eastern Province were selected to participate in the study. USAID funds for the English Proficiency Programme target pupils in these regions. The ESST classes were randomly selected from all the schools that receive EPP materials in the identified regions. Non-ESST schools were selected on the basis of their willingness to provide ESST with information on their programme. The selection of Standard 4 pupils gives ESST the opportunity to conduct a follow-up study when these pupils are in Standard 5, their last year at primary school.

The sample consists of 96 pupils who have received the EPP materials and 104 pupils who have never received the materials. Two Standard 4 classes from two different schools in each of the three regions were selected, a total of six classes. One of the classes in each pair consisted of pupils who have received the EPP materials for one, two or three years (ESST), and pupils in the other class who have never received any EPP materials (non-ESST).

Instrumentation

Development of worksheets

The IEQ worked collaboratively with ESST to develop the worksheets (instruments) used in the study. Initially, ten worksheets based on the contents of the EPP books and materials were developed by ESST. These worksheets were pilot tested in schools in the Eastern and Western Cape Provinces. The worksheets measure the degree in which the following cognitive functions[2] are evident :

[2] These cognitive functions are in line with theories on child development espoused by Piaget (1959), Haywood (1993) Vigotsky (1978)and Feuerstein (1991).

- understanding spatial and temporal concepts
- precision and accuracy in data gathering
- spontaneous comparative behaviour
- planning and self-correction
- selection of relevant cues and clues
- verbalised response indicating understanding of concepts
- accurate problem identification
- integrated grasp of reality and spontaneous summative behaviour

The following indicators were formulated by ESST, in collaboration with the IEQ, as appropriate measures of the identified cognitive functions:

- language dexterity
- ability to read and write English
- general knowledge
- graphic perception and visual transportation
- graphic expression
- curiosity and exploration
- problem solving strategies
- logical deduction and inferential thinking

The indicators of cognitive functions listed above were condensed into three superordinate categories:

1. English Proficiency which includes linguistic fluency, usage, reading, writing, and comprehension.
2. Problem Solving which embodies problem identification, identifying and understanding the rules, logical thinking, hypothesis testing and reasoning.
3. Graphicacy which refers to picture reading, expression, perception, originality and creativity.

The worksheets were reviewed collaboratively by the IEQ and ESST and four worksheets, that each measured all the skill categories, were selected for data collection. A second set of worksheets measuring the same skill categories were developed for the second round of data collection. All the worksheets used in this study appear in Appendix C.

Scoring

Criteria for scoring the worksheets were developed. Each of the three categories or performance areas was defined in terms of five descriptors which range from outstanding (5) to inadequate (1). Each descriptor consisted of indicators appropriate for that descriptor.

The criteria for scoring all the performance areas appear in Appendix D. Table 1 illustrates the descriptors and the indicators for scoring the Problem Solving category of the worksheet.

Table 1:
Criteria for Scoring Problem Solving

inadequate (1)	*poor (2)*	*competent (3)*	*very good (4)*	*outstanding (5)*
◦ has not understood the problem	◦ vaguely understood the problem	◦ identified the problem	◦ correctly identified the problem	◦ correctly identified the problem
◦ did not understand any of the rules	◦ understood very few of the rule	◦ understood some of the rules	◦ understood most of the rules	◦ understood all the rules
◦ no evidence of logical thinking	◦ very little evidence of logical thinking	◦ some evidence of logical thinking	◦ clear evidence of logical thinking in most categories	◦ clear evidence of logical thinking in all categories
◦ outcome has no bearing on problem and no reasoning	◦ incorrect outcome and wrong reasoning	◦ correct outcome but not necessarily right reason	◦ correct outcome and reasoning	◦ correct outcome and reasoning

The maximum score for each category was "5" and the total score for each worksheet was 15. Worksheets were scored, after each data collection phase, by an independent marker who was trained by the English Proficiency Programme co-ordinator and facilitators. ESST facilitators checked Phase I and II scored worksheets for scoring consistency by re-scoring a random selection of ten sheets for each class.

Data Collection

Data were collected in two phases. Phase I data were collected during February and March 1995. The purpose of the Phase I data was to provide baseline data for the study.

Phase II data were collected eight months after Phase I, in October 1995. Between February and October 1995, teachers of the pupils who received EPP materials, attended the Programme's Teacher Methodology Project workshops. These workshops, which were in their pilot phase during this period, had begun a process of training teachers to become facilitators in the effective use of the EPP materials in the learning environment. The data collected in Phase II would reflect whether teacher facilitation, among other factors such as maturation, made a difference in the pupils' scores over time.

Data were collected by the EPP programme facilitators. Teachers of pupils, including non-ESST pupils, who participated in the study were informed that ESST needed to collect information to help them improve their magazines and books. To ensure the co-operation of teachers of non-ESST pupils, they were told that ESST would try to procure funds to get them books in the future. Worksheets were administered to the pupils by the programme facilitators. The exercises on the worksheets were completed by the pupils in the presence of the EPP facilitators to ensure that teacher involvement during data collection would not be a factor to consider during scoring and analysis.

Data Analysis

The analysis of the numerical data, also called quantitative data, was done using a variety of descriptive and inferential statistics. Descriptive statistics are those that are used to summarise and describe data including frequency counts (such as the number of girls and the number of boys), mean scores, standard deviations and multivariate analysis of variance with repeated measures. Standard deviation refers to how "spread out" the scores are. The more widely spread the scores are spread out, the larger the standard deviation value.

Inferential statistics are those used to determine if differences among groups or relationships between groups are "real" as opposed to a matter of chance. Inferential statistics used in this report include F tests (or analysis of variance with repeated measures). F tests are used to determine if differences among two or more groups are real. The levels of significance or p (probability) value indicates the "odds" that a difference or a relationship

is "real". For example, p=0.04 means that the chances that the difference between groups is "real" are 96 out of 100. Statistical significance indicates if a difference is real; it does not tell if it is meaningful or important -- that judgement is made by the researcher, the programme staff and the reader.

The descriptive and inferential statistics were done primarily using SPSS (Statistical Package for the Social Sciences). A full statistical analysis appears in Appendix E.

Findings

The results of the study are presented as follows:

1. the demographic profile of the pupils' context;

and

- achievement gains of ESST and non-ESST pupils
- effects of gender and region on pupils' achievement gains of ESST and non-ESST pupils

in terms of:

2. English Proficiency
3. Problem Solving
4. Graphicacy

Findings will be examined in light of the evaluation questions posed earlier, which focus specifically on the relationship between the use of EPP materials by Standard 4 pupils and performances in English Proficiency, Problem Solving and Graphicacy.

1. Demographic Profile

1.1 Pupils

The sample consisted of a total of 96 ESST and 104 non-ESST pupils.[3] The breakdown in terms of gender and region appears in Table 2.

Table 2:

Number of ESST and non-ESST Pupils by Region and Gender

Region	*ESST Pupils (n=96)*			*non-ESST Pupils (n=104)*		
	Girls	*Boys*	*Total*	*Girls*	*Boys*	*Total*
Eastern Cape (Kwazakhele)	18 (46%)	21 (54%)	39	15 (50%)	15 (50%0	30
Western Cape (Khayelitsha)	17 (74%)	6 (26%)	23	18 (43%)	24 (57%)	42
West Coast (Darling)	20 (59%)	14 (41%	34	14 (44%)	18 (56%)	32
TOTAL	55 (57%)	41 (43%)	96	47 (45%)	57 (55%)	104

[3] ESST pupils refer to the pupils who received the programme materials and non-ESST pupils refer to pupils who have not received any programme materials.

In Table 2 it is evident that the number of girls and boys in each region is comparable. There are fewer boys in the ESST classes than in the non-ESST classes, except for the Eastern Cape where there are more boys than girls. There are 57% girls in ESST classes compared to 43% boys whereas in the non-ESST classes there are 45% girls and 55% boys. It is noteworthy that there are only 23 pupils in the Khayelitsha ESST class compared to 42 in the non-ESST class. ESST facilitators reported that, during Phase II of data collection, it was found that a number of pupils had left the school and only 23 of those who had completed Phase I worksheets remained. However, the overall numbers indicate that there is a total of 102 girls compared to 98 boys in the sample.

The ages of both ESST and non-ESST pupils range between 10 and 16 years and there is one 17 year old in the ESST class in Khayelitsha. The overall mean age of both ESST and non-ESST pupils is 12.7 years.[4] This is slightly above the expected mean age of 11 or 11.5 years for Standard 4 pupils based on the assumption that children start primary schooling at the age of six.

English is not the first language of the pupils in all the regions. In Khayelitsha (Western Cape) and Kwazakhele (Eastern Cape) isiXhosa is the pupils' home-language while in the West Coast, Afrikaans is the home-language. English is invariably only spoken at school and more specifically only during the English lesson. ESST facilitators have reported that, at schools on the West Coast, pupils were taught English through the medium of Afrikaans before ESST intervention.

1.2 Schools

The West Coast schools are located in a rural area, the Khayelitsha schools in a peri-urban township, and the Eastern Cape schools in a semi-rural township. However, there are distinct differences between township schools in the Western and Eastern Cape Provinces. In the Western Cape, the schools are relatively new and most of the children live in surrounding informal settlements. School are unstable and attrition rates are high because families tend to move from one area to another. In the Eastern Cape, the schools are old and the communities are stable. In the West Coast, schools are located far from each other and often pupils attend a particular school because there is no other alternative. Most of the

[4] Pupils' scores were not analysed by the age variable because there were no differences in the mean ages of ESST and non-ESST pupils.

schools, irrespective of region, have inadequate facilities. For example, there is no electricity and many of the buildings are in disrepair.

2. ENGLISH PROFICIENCY

English Proficiency includes linguistic fluency, usage, reading, writing and comprehension. Pupils are expected to be able to read sufficiently well so as to interpret, understand and carry out both stated and inferred instructions. Original and creative ideas should be communicated in English. Furthermore, the ideas that are expressed should reflect careful planning and integrated thought processes. ESST views grammatical errors as manifestations of language performance and it is from this perspective that grammatical competency is seen as a tool in the service of clarity of thought.

2.1 Achievement Gains in English Proficiency of ESST and non-ESST Pupils

Table 3 illustrates Phase I and II English Proficiency mean scores of ESST and non-ESST pupils over time, irrespective of region or gender.

Table 3:

English Proficiency Mean Scores of ESST and non-ESST Pupils over Time

	Phase I		*Phase II*	
	Mean	*SD*	*Mean*	*SD*
ESST (n=96)	2.2	.57	3.0	1.1
non-ESST (n=104)	1.9	.85	2.2	.89

In Phase II, the ESST pupils' mean scores increased by 0.8 to 3.0, out of a maximum of "5", compared to an increase of 0.3 by non-ESST pupils. Increased Phase II mean scores of both ESST and non-ESST pupils was an expected outcome because of learner maturation. Results of an analysis of variance with repeated measures found a significant interaction between ESST/non-ESST pupils and time on English Proficiency scores.[5] This means that between Phase I and II, ESST pupils gained more English Proficiency skills than non-ESST pupils. It is also noteworthy that the standard deviation of the ESST pupils' English Proficiency scores increased in Phase II from .57 to 1.1 and this shows that the scores were higher and more widely spread out than in Phase I. From this it can be hypothesised that pupils who used EPP materials progressed according to their own abilities and pace. In contrast to this, the

[5] Interaction between ESST/non-ESST and time for English Proficiency: F=13.2 p=0.00

standard deviation of the non-ESST pupils' scores was relatively consistent from Phase I to Phase II which implies that their scores increased slightly and were not spread out.

2.2 *Effects of the interaction between ESST/non-ESST scores and Time and Region on the English Proficiency scores.*

Table 4 depicts the English Proficiency mean scores of ESST and non-ESST pupils over time by region.

Table 4:

English Proficiency Mean Scores of ESST and non-ESST Pupils over Time by Region

	Phase I		*Phase II*	
	Mean	*SD*	*Mean*	*SD*
ESST				
Eastern Cape (n=39)	2.3	.58	2.9	.85
Khayelitsha (n=23)	2.0	.21	4.0	.93
West Coast (n=34)	2.1	.69	2.5	1.1
non-ESST				
Eastern Cape (n=30)	1.4	.56	1.6	.77
Khayelitsha (n=42)	1.8	.82	2.6	.66
West Coast (n=32)	2.4	.84	2.2	.94

ESST and non-ESST pupils increased their English Proficiency mean scores over time in each region with the exception of the non-ESST pupils in the West Coast. These pupils' mean scores actually **decreased** over time. The greatest increase in Phase II mean scores is evident in the scores of both ESST and non-ESST pupils in Khayelitsha. ESST pupils increased by 2.0 to 4.0 compared to a much smaller gain of 0.8 by non-ESST pupils. These increases may be attributed to pupils in Khayelitsha being exposed to an environment where more English is heard and spoken. In the Eastern Cape, ESST pupils increased by 0.6 compared to the non-ESST pupils' increase of 0.2.

Results of an analysis of variance with repeated measures found a significant interaction between ESST/non-ESST pupils and time by region on English Proficiency scores.[6] This finding shows that the EPP materials had a positive effect on ESST pupils English skills in the different regions at varying degrees.

[6] Interaction between ESST/non-ESST and time by region for English Proficiency: F=1.29, p=0.04

2.3 *Effects of the interaction between ESST/non-ESST pupils' English proficiency scores and Time and Gender*

Table 5 represents the English Proficiency mean scores of ESST and non-ESST pupils by time by gender.

Table 5:
English Proficiency Mean Scores of ESST and non-ESST pupils by Time by Gender

	Phase I		*Phase I*	
	Mean	*SD*	*Mean*	*SD*
ESST				
Boys (n=41)	2.4	.58	3.2	1.0
Girls (n=55)	2.1	.53	2.9	1.1
non-ESST				
Boys (n=57)	1.9	.90	2.3	.90
Girls (n=47)	1.9	.80	2.2	.87

There were no statistical differences between girls and boys on either Phase I or Phase II mean scores. The mean scores of both ESST and non-ESST girls and boys increased in Phase II as anticipated, but the increases are greater for ESST pupils compared to the non-ESST pupils. ESST girls and boys, both increased by 0.8 while non-ESST girls increased by 0.3 and the boys 0.4. The results of the analysis of variance with repeated measures found no significant interaction between ESST/non-ESST and time by gender. The EPP materials appear to have similar positive effects on girls and boys in terms of English Proficiency.

2.4 *Discussion and Conclusion on English Proficiency*

When Phase I and Phase II mean scores were compared, it was found that ESST pupils achieved significantly higher scores than non-ESST pupils by time and by region. This finding suggests that the use of the EPP materials together with teacher facilitation is likely to be associated with improved English Proficiency, in varying degrees by region, of the ESST pupils of the sample.

The mean scores of pupils in the West Coast are interesting because in Phase I non-ESST pupils scored slightly higher than ESST pupils, yet over time it was found that ESST pupils **increased** their scores by 0.4 whereas non-ESST scores **decreased** by 0.2. It is possible that non-ESST pupils in the West Coast are still being taught English through the medium of Afrikaans which may account for a lack of growth in these pupils' English language skills.

The findings on the interaction of time and gender on the pupils' English Proficiency show that ESST girls and boys do not achieve significantly different scores. This finding suggests that the EPP materials have similar effects on all the Standard 4 pupils that used them, irrespective of gender.

From the analysis it can be concluded that the EPP materials have a positive effect on ESST pupils' English Proficiency scores by region, albeit in varying degrees. Furthermore, it can be concluded that the EPP materials do not have differential effects by gender.

3. PROBLEM SOLVING

Problem Solving, in the context of this study, refers to the learners ability to identify the problem, determine the rules and parameters of the problem, think logically and arrive at an outcome that shows carefully considered reasoning. The presentation of the solution should be clearly communicated so that these cognitive functions become evident.

3.1 Achievement gains in Problem Solving of ESST and non-ESST Pupils

Table 6 illustrates Phase I and II Problem Solving mean scores of ESST and non-ESST pupils, irrespective of region or gender.

Table 6:
Problem Solving Mean Scores of ESST and non-ESST Pupils over Time

	Phase I		*Phase II*	
	Mean	*SD*	*Mean*	*SD*
ESST (n=96)	2.1	.71	2.8	1.0
non-ESST (n=104)	2.1	.80	2.3	.84

There is no difference between ESST and non-ESST pupils Phase I mean scores. The increase in Phase II was anticipated. In Phase II, the ESST pupils' mean scores increased by 0.7 from 2.1. to 2.8 compared to an increase of 0.2 by non-ESST pupils. As with English Proficiency, the standard deviation of the ESST pupils' Problem Solving scores increased in Phase II from .71 to 1.0 and this shows that the Phase II scores were much higher and widely spread. From this it can be inferred that the Problem Solving skills of pupils who used EPP materials progressed according to individual abilities. The standard deviation of the non-ESST pupils' scores was relatively consistent from Phase I (.80) to Phase II (.84) and this implies that their scores only increased marginally and were grouped together. The

results of an analysis of variance with repeated measures found a significant interaction between ESST/non-ESST pupils and time on Problem Solving scores.[7] This finding suggests that pupils who used the EPP materials are likely to have gained more Problem Solving skills than pupils without EPP materials.

3.2 *Effects of the interaction between ESST/non-ESST scores and Time and Region on Problem Solving*

In Table 7, the Problem Solving mean scores of ESST and non-ESST pupils by time by region are illustrated.

Table 7:
Problem Solving Mean Scores of ESST and non-ESST Pupils by Time by Region

	Phase I		*Phase II*	
	Mean	*SD*	*Mean*	*SD*
ESST				
Eastern Cape (n=39)	2.6	.60	2.6	.97
Khayelitsha (n=23)	2.1	.42	3.6	.78
West Coast (n=34)	1.5	.56	2.4	.88
Non-ESST				
Eastern Cape (n=30)	1.9	.37	1.9	.68
Khayelitsha (n=42)	1.8	.75	2.7	.68
West Coast (n=32)	2.7	.87	2.1	.94

The improvement of Problem Solving skills is an integral component of the English Proficiency Programme. The comparative mean scores of ESST and non-ESST pupils by region for the two phases reflected in Table 6 are very interesting.

The mean scores of both ESST and non-ESST pupils in the Eastern Cape are the same for both phases. It indicates that the pupils have neither improved nor have they deteriorated in terms of their Problem Solving skills. The Phase II mean scores of ESST pupils in this region are contrary to the expectation that the Problem Solving scores would have increased. Again, both ESST and non-ESST pupils in Khayelitsha increased their mean scores over time. ESST pupils did however make greater gains (1.5) compared to the 0.9 gain made by the non-ESST pupils. As with the English Proficiency mean scores of pupils in the West Coast, the ESST pupils increased their mean score by 0.9 to 2.4 compared to a decrease in the mean scores of non-ESST pupils by 0.6. This indicates that there are gains in the ESST

[7] Interaction between ESST/non-ESST and time for Problem Solving : F=14.3, p=0.00

pupils Problem Solving skills compared to a decline in the Problem Solving skills of non-ESST pupils. It would be enlightening to establish what transpired in the non-ESST schools between March and October 1995, which may possibly account for the situation there.

Results of an analysis of variance with repeated measures found a significant interaction between ESST/non-ESST pupils and time by region on Problem Solving scores.[8] This finding, as with the finding on English Proficiency, indicates that the EPP materials had a positive effect on ESST pupils Problem Solving skills in the different regions at varying degrees.

3.3 *Effects of the interaction between ESST/non-ESST scores and Time and Gender on Problem Solving*

Table 8 represents the English Proficiency mean scores of ESST and non-ESST pupils by time by gender.

Table 8:

Problem Solving Mean Scores of ESST and non-ESST pupils by Time by Gender

	Phase I		*Phase II*	
	Mean	*SD*	*Mean*	*SD*
ESST				
Boys (n=41)	2.2	.68	2.8	1.1
Girls (n=55)	2.0	.71	2.7	1.0
non-ESST				
Boys (n=47)	2.2	.90	2.4	.83
Girls (n=57)	2.0	.67	2.2	.84

The mean scores of both ESST and non-ESST girls and boys increased in Phase II as anticipated, but the increases are greater for ESST pupils compared to the non-ESST pupils. ESST girls' gain in scores were by 0.7 to 2.7 while the ESST boys increased by 0.6 to 2.7. In the non-ESST classes, both girls and boys increased by only 0.2. The results of the analysis of variance with repeated measures found no significant interaction between ESST/non-ESST and time by gender on Problem Solving scores. This implies that the use of EPP materials do not have differential effects by gender in terms of Problem Solving.

[8] Interaction between ESST/non-ESST and time by region for Problem Solving: F=4.19, p=0.00

3.4 *Discussion and Conclusions on Problem Solving*

An increase in the Problem Solving scores of ESST pupils was anticipated in each of the three regions because one of the goals of the EPP materials is to improve cognitive skills using English as the mediation tool. Over time ESST pupils made significantly greater gains compared to non-ESST pupils. This improvement in the ESST pupils' Problem Solving scores can be associated with the use of EPP materials.

ESST pupils did not make the same degree of gains in their Problem Solving skills from one region to another. The Phase II mean scores of the ESST pupils in the Eastern Cape region raise concern because the effects of the EPP intervention on their Problem Solving skills are not evident as their scores remained unchanged. A possible explanation for the situation in the ESST classes in this region may be that ESST facilitators have less on-going contact with these schools compared to, for example, Khayelitsha. This may be a tenable explanation as the greatest improvement in ESST pupils' mean scores occurs in Khayelitsha, an area that is easily accessible to ESST facilitators. The rate of increase of the ESST pupils' scores in the West Coast is very positive if it is considered that teachers in this region used to teach English through the medium of Afrikaans and that there is a decrease in the Problem Solving scores of non-ESST pupils in the same region. Notwithstanding the purpose of this impact evaluation, it is disturbing that there is little or no gains in the mean scores of non-ESST pupils in the West Coast.

Both ESST and non-ESST girls and boys improved their Problem Solving scores with ESST pupils making greater gains. However, the gains made by the ESST pupils are not related to gender. This implies that the manner in which the EPP materials may have contributed to the improvement of Problem Solving skills do not affect girls and boys differently.

From the analysis it can be concluded that the EPP materials have had a positive impact on the ESST pupils' Problem Solving scores over time and by region. The findings on the interaction between ESST and non-ESST by time and gender show that the materials do not differentiate by gender.

4. GRAPHICACY

Cognitive functions such as spatial orientation and interpretation of visual images are expected to develop with the use of the EPP materials. It is from this perspective that Graphicacy refers to the comprehension and assimilation of graphic perceptions, clarity of expression as well as creativity and originality in drawings. Learners are expected to "read" pictures and express themselves using pictures in a clear manner.

4.1 Graphicacy Mean Scores of ESST and non-ESST Pupils over Time

Table 9 illustrates Phase I and II Graphicacy mean scores of ESST and non-ESST pupils over time, irrespective of region or gender.

Table 9:
Graphicacy Mean Scores of ESST and non-ESST Pupils over Time

	Phase I		*Phase II*	
	Mean	*SD*	*Mean*	*SD*
ESST (n=96)	2.0	.64	2.6	93
non-ESST (n=104)	2.0	.79	2.2	.85

The ability to "read" pictures and graphically express ideas is closely related to Problem Solving skills, because there are cognitive processes involved for both performance areas.

There is no difference between ESST and non-ESST pupils' Phase I scores. In Phase II the ESST pupils' mean scores increased by 0.6 to 2.6 compared to an increase of 0.2 to 2.2. by non-ESST pupils. As with English Proficiency and Problem Solving, the standard deviation of the ESST pupils' Graphicacy scores increased in Phase II from .64 to .93 and this shows that the Phase II scores increased and became more spread out. From this it can be deduced that Graphicacy scores of pupils who used EPP materials progressed according to their individual abilities and pace. The standard deviation of the non-ESST pupils' scores was relatively consistent from Phase I (.79) to Phase II (.85) and this means that their scores increased only marginally and were grouped together.

A growth in ESST pupils' Graphicacy scores was expected because the use of visual images is integral in the EPP materials. The results of an analysis of variance with repeated measures found a significant interaction between ESST/non-ESST pupils and time on

Graphicacy scores.[9] The significant gains made by ESST pupils' Graphicacy scores, compared to those of non-ESST pupils', suggest that as ESST pupils engage with the EPP materials, their graphic perceptions and ability to express themselves graphically sharpens.

4.2 *Effects of the interaction between ESST/non-ESST pupils' Graphicacy scores and Time and Region*

The comparative mean scores of ESST and non-ESST pupils' for Graphicacy by time and region are reflected in Table 10.

Table 10:
Graphicacy Mean Scores of ESST and non-ESST Pupils over Time by Region

	Phase I		*Phase II*	
	Mean	*SD*	*Mean*	*SD*
ESST				
Eastern Cape (n=39)	2.1	.40	2.4	.81
Khayelitsha (n=23)	2.6	.67	3.4	.90
West Coast (n=34)	1.5	.51	2.2	.70
non-ESST				
Eastern Cape (n=30)	1.9	.31	1.8	.65
Khayelitsha (n=42)	2.0	.91	2.7	.74
West Coast (n=32)	2.2	.91	2.0	.88

The Graphicacy mean scores of all the ESST pupils increased over time in each region whereas non-ESST pupils in Khayelitsha only increased their Graphicacy scores over time. ESST and non-ESST pupils in Khayelitsha each made a gain of 0.7. In the West Coast, ESST pupils increased their Graphicacy scores by 0.7 from to 2.2. Once again, the scores of non-ESST pupils in the West Coast as well as in the Eastern Cape **decreased**, albeit by a very small margin.

Results of an analysis of variance with repeated measures found a significant interaction between ESST/non-ESST pupils and time by region on Graphicacy scores.[10] This finding shows that the EPP materials had a positive effect on ESST pupils' Graphicacy skills in the different regions at varying degrees.

[9] Interaction between ESST/non-ESST and time for Graphicacy : F=7.7, p=0.00
[10] Interaction between ESST/non-ESST and time by region for Graphicacy : F=1.7, p=0.02

4.3. *Effects of the interaction between ESST/non-ESST pupils' Graphicacy scores and Time and Gender*

Table 11 represents the Graphicacy mean scores of ESST and non-ESST pupils over time by gender.

Table 11:

Graphicacy Mean Scores of ESST and non-ESST pupils over Time by Gender

	Phase I		*Phase II*	
	Mean	*SD*	*Mean*	*SD*
ESST				
Boys (n=41)	2.1	.67	2.6	.80
Girls (n=55)	1.9	.61	2.6	1.0
non-ESST				
Boys (n=47)	2.1	.89	2.3	.81
Girls (n=57)	2.0	.69	2.2	.90

There were no statistical differences between girls and boys on either Phase I or Phase II mean scores. ESST girls increased their mean scores by 0.7 to 2.6. and the ESST boys increased their mean scores by 0.5 to 2.6. Both girls and boys in non-ESST classes increased by 0.2. The results of the analysis of variance with repeated measures found no significant interaction between ESST/non-ESST and time by gender on Graphicacy scores.

As the findings for the previous performance areas indicated, the EPP materials appear to have similar positive effects on girls and boys with regard to Graphicacy.

4.4 *Discussion and Conclusion on Graphicacy*

This performance area measures the extent to which pupils have developed spatial orientation skills and how they interpreted and represented visual images.

The findings show that initially there were no differences between ESST and non-ESST pupils in terms of "reading" and responding to pictures. ESST pupils made greater gains in their Graphicacy scores compared to non-ESST pupils over time and by region. The finding of the interaction of time and region on Graphicacy scores seems to indicate that there is an association, at varying degrees, between pupils' interacting with graphic materials and developing skills in graphic perception and expression. Gains made by ESST pupils fluctuated from 0.3 in the Eastern Cape to 0.7 in Khayelitsha and the West Coast, respectively. Non-ESST pupils mean scores decreased in the Eastern Cape and the West

Coast. The decrease in Graphicacy scores of non-ESST pupils in these two regions is not unexpected because "traditional" materials used by pupils tend to emphasise text rather than graphics. It is important to note that the decrease in Graphicacy mean scores of non-ESST pupils in the West Coast and Eastern Cape has implications for the development of cognitive skills, such as spatial orientation.

The finding on the interaction of time and gender between ESST and non-ESST pupils indicates that the interaction is not significant. This signifies that the materials do not differentiate by gender.

General Discussion and Conclusions

Traditional textbooks, especially at the Standard 4 level, seem to emphasise the written word. EPP materials, which include pictures, games and puzzles, are often regarded as "fun" and therefore possibly considered not to be valuable to learning. The findings of this study seem to dispute this viewpoint and support the ESST notion that pupils learn subject matter and cognitive skills by interacting with stimulating, relevant and graphically presented materials.

ESST pupils made gains in all three performance areas that were measured in this study.

For English Proficiency, ESST pupils' Phase 1 mean score of 2.2 indicated that, according to the criteria of scoring (Appendix D), they followed some of the instructions, showed very little originality and were not very clear in expressing themselves. In Phase II, their mean score of 3.0 indicated that they followed most instructions, showed some originality, and expressed their thoughts more clearly than in the Phase I worksheets.

In terms of Problem Solving, ESST pupils' mean score increased from 2.1 to 2.8. This indicated that, while pupils at Phase I vaguely understood the problem, understood very few rules and showed very little evidence of logical thinking, in Phase II they identified the problem, understood some of the rules and provided some evidence of logical thinking.

The Graphicacy Phase I ESST pupils' mean score of 2.1 denoted that they displayed very little originality and graphic perception whereas their Phase II mean score of 2.6 indicated that they showed some original thinking and the ability to relate graphics to the text.

This signifies that the EPP materials can be positively associated with the development of cognitive skills identified for this study and the improvement of English language skills over time.

There are also significant interactions between ESST/non-ESST pupils' mean scores and time by region in all three performance areas. The implication of this result is that the positive impact of the EPP materials were experienced differently by each region. The level of ESST pupils' gain scores in each of the areas measured in this study appears to depend on

the region in which the pupils are located. There may be a number of factors that are unique to a particular region that may influence the extent of impact of the EPP materials. Factors such as whether the pupils' mother-tongue is isiXhosa or Afrikaans; whether and to what extent pupils are exposed to the English language outside the school environment; whether pupils communicate with each other in English outside the English lesson; the level of incidental English -language reading materials, for example newspapers, available in the area and in the home; the amount of time the pupils spend interacting with the materials; the level of contact between ESST facilitators and the pupils, teachers and schools; differences in teachers' mediation and facilitation skills in the use of the materials; and the level of other resource provisioning at the schools in each of the regions may possibly influence the manner in which pupils in a specific region used the EPP materials.

It is clear from the findings that there are no significant interactions between ESST/non-ESST pupils' mean scores and time by gender in all three performance areas. This implies that the materials have equally positive effects on girls and boys which augurs well for the English Proficiency Programme.

Utilisation of Findings

Programme Development

1. The findings that relate to differences between ESST and non-ESST pupils in terms of English Proficiency, Problem Solving and Graphicacy by time, and by the interaction of time and gender, highlight the positive effects of the EPP materials. ESST needs to continue to emphasise these performance areas in their programme.

2. The results for each performance area by the interaction of time and region imply that the EPP materials were applied differently by regions. The results raise the question about whether, and to what extent, geographical proximity of the schools to ESST may account for the materials being applied at varying degrees. ESST may consider reviewing the structure and frequency of follow-up visits by EPP facilitators to participating schools and should be more specific about what the classroom monitoring and support visits entail.

3. ESST should address the question about what it means to participate in the Teacher Methodology Project. This is important because if the teacher is to play a critical role in facilitating a learning-centred environment, then the Teacher Methodology Project, as a component of the EPP, needs to be clearly defined.

4. ESST facilitators who work with teachers on an on-going basis can use the results of the impact assessment to target their work with teachers.

Institutionalisation

1. ESST should consider identifying other measurable goals of the programme and develop learner worksheets that are appropriate across the curriculum in collaboration with the teachers with whom they work. The worksheets used in this study can be revised as needed and other dimensions added to fit these changing needs.

2. Worksheets can be administered by both the teachers and EPP facilitators to monitor and evaluate the programme on an on-going basis. This would provide a systematic internal monitoring system for programme improvement.

POLICY

1. The English Proficiency Programme, as an alternative pedagogical philosophy, has shown to be very successful in terms of improving English language- Problem-Solving- and Graphicacy skills of this sample of pupils. ESST strategies to improve educational quality should address the provision of relevant and stimulating resources to achieve goals such as these. Investing in, and/or forming partnerships with organisations such as ESST has the potential to greatly improve language and thinking skills of pupils in predominantly disadvantaged schools.

2. The EPP materials and the Teachers' Methodology Project are relevant in diverse contexts and it is from this perspective that the programme has the potential to be delivered in all the provinces of South Africa.

3. The EPP team has the expertise, capacity, and experience to contribute to policy formulation for primary education in areas such as curriculum -, teacher - and materials development and holistic assessment strategies.

FURTHER STUDIES

1. Are the skills acquired by pupils who use EPP materials maintained throughout primary school?

2. Are the skills acquired by pupils who use EPP materials transferred to secondary school?

3. To what extent do teachers' facilitation skills in creating learning-centred environments and using the materials impact on pupils' performance?

4. Do monitoring and follow-up visits add value to the implementation of the English Proficiency Programme at the classroom level?

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Appendices

Appendix A

ESST Personnel Involved in the Evaluation Process

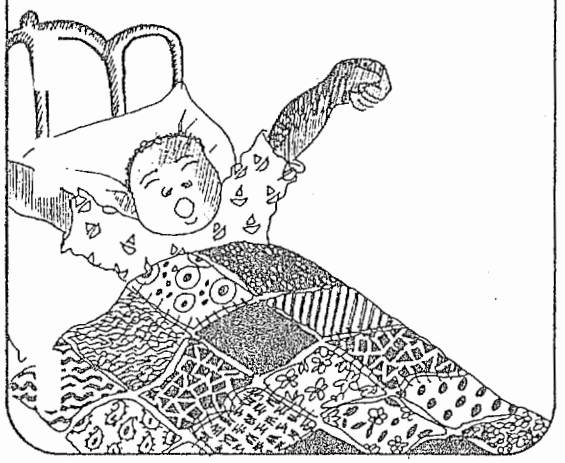
- Dries Sinclair
- James Olivier
- Lydia Abel
- Emelda Diouff
- Kondi Masutha
- Shaun Fortuin

Appendix B:

Examples of EPP materials

YES Feelings and NO Feelings

ommy wakes up in the morning.



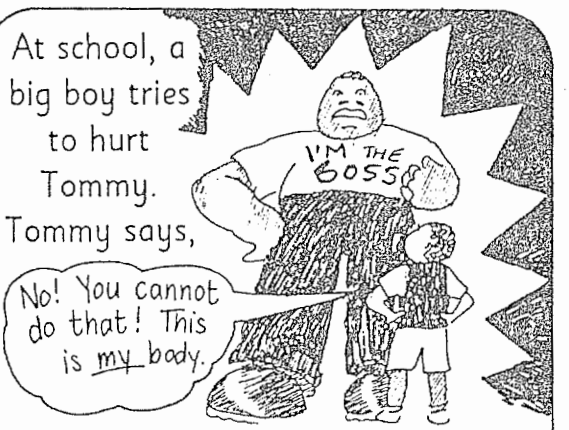
He washes his body.

Tommy cares for his body. Tommy's body belongs to **him**.

ommy goes to school. He kisses his mother goodbye.

Tommy gets a YES feeling when he kisses his mother goodbye. A YES feeling is a nice feeling. It is when you feel safe.

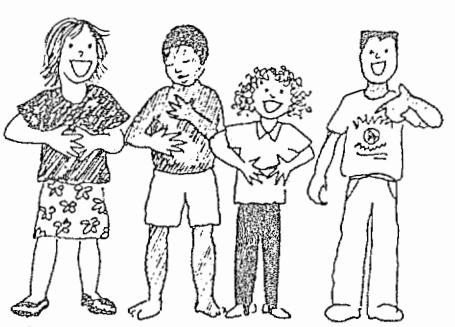
At school, a big boy tries to hurt Tommy. Tommy says,



Tommy gets a **NO** feeling when somebody tries to hurt him. A NO feeling is an unhappy feeling. It is when you do not feel safe.

After school, a man tries to touch Tommy. Tommy says,

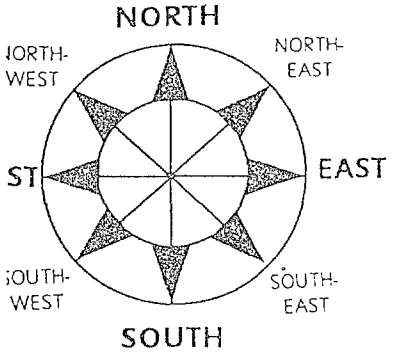
Tommy gets a NO feeling when this man tries to touch him.



Our bodies belong to us. Nobody may do things to our bodies that we do not like. If we get a NO feeling, we say "NO!".

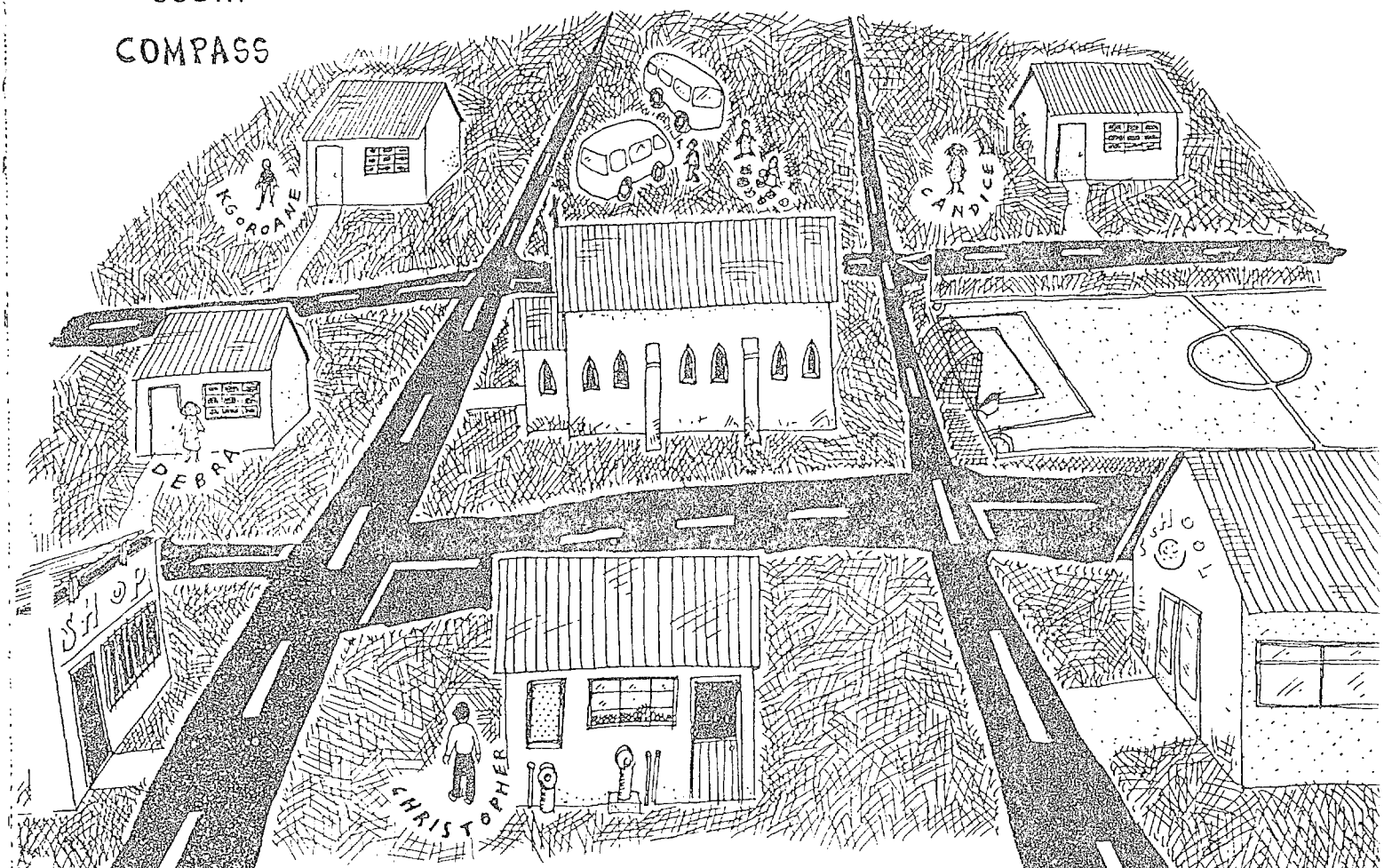
If somebody tries to touch you in a way that gives you a NO feeling, tell your mother or a grown-up that you trust. You can also phone CHILDLINE at (08000) 55 555. They will help you.

NORTH, SOUTH, EAST OR WEST?



COMPASS

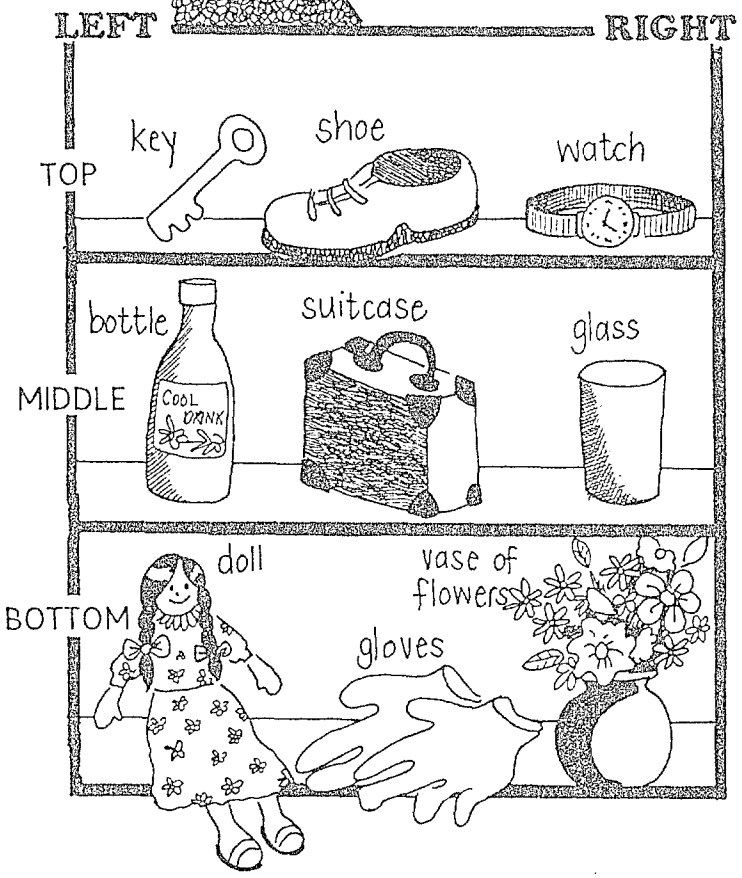
Debra, Kgoroane, Christopher and Candice need to go to different places. They need to know in which direction they should go. They could go in any of the directions shown on the compass to the left. For example, if Candice wants to go to the shop, she must walk south-west. Can you help them?



1. Christopher must walk ..... to get to the taxi rank.
2. Kgoroane must walk..... to get to the church.
3. Debra must walk ..... to get to the shop.
4. Candice must walk ..... to get to the taxi rank.
5. Kgoroane must walk ..... to get to the school.
6. Debra must walk ..... to get to the taxi rank.
7. Christopher must walk ..... to get to the soccer field.
8. Candice must walk ..... to get to the church.
9. Debra must walk ..... to get to the church.
10. Kgoroane must walk ..... to get to the soccer field.

PUZZLES FOR YOU

Hello, friends! I love puzzles, don't you? Puzzles can keep us busy for hours! Enjoy these - I made them up just for you!

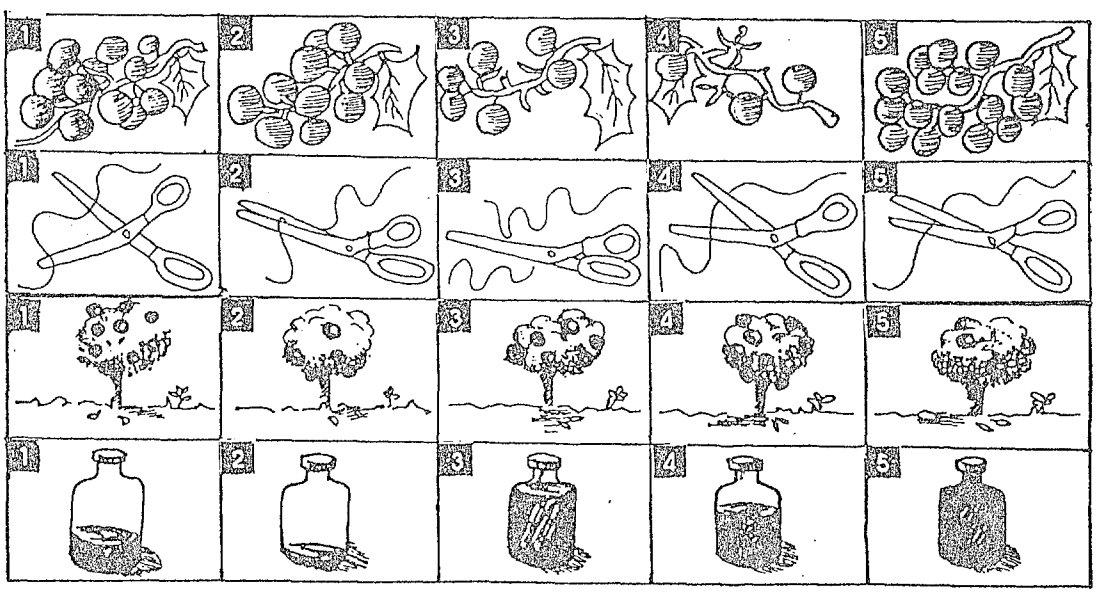


Look at the three shelves on the left. There is a top shelf, a middle shelf and a bottom shelf. See if you can answer these questions:

1. What is on the **right-hand side** of the **top** shelf? .....
2. What is on the **left-hand side** of the **bottom** shelf? .....
3. The suitcase is in the **middle** of the ..... shelf.
4. The vase of flowers is on the ..... **hand** side of the ..... shelf.
5. What is on the **left-hand side** of the **middle** shelf? .....
6. What is in the **middle** of the **bottom** shelf? .....

WRITE YOUR ANSWERS HERE!

All these pictures are in the wrong order.
Can you put them in the right order?
Write the answers in the spaces next to each row.



— — — — —

— — — — —

— — — — —

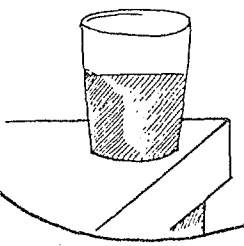
— — — —

Mr Maths explains

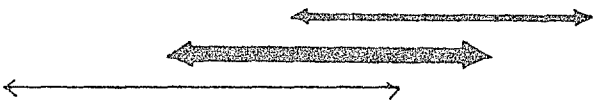
LINES and ANGLES

Hello, friends! Today I have something exciting and different for you. It is all about lines and angles. You'll learn some new words and some strange new ideas!

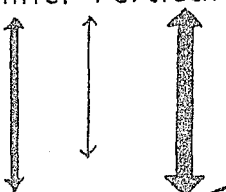
Do this little experiment. Fill a glass with water and place it on a table. You can see that the **surface** of the water is level with the floor. Now tilt the glass to one side. What happens to the surface of the water? It remains level with the floor!

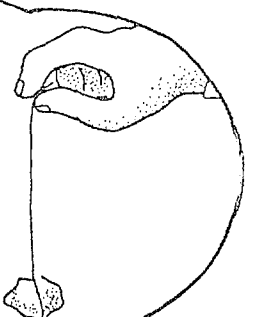


We say the surface of the water is **horizontal**. Horizontal means level with the floor. These are **horizontal lines**.



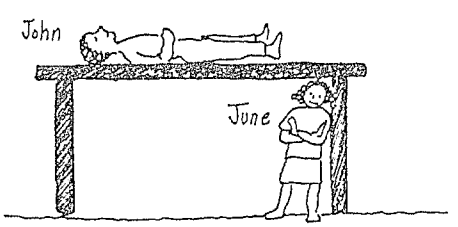
Now tie a stone to the end of a piece of string. The string will hang straight down. It forms a straight line. We call this a **vertical** line. Vertical lines run from top to bottom. These are **vertical lines**.





Now answer these questions:

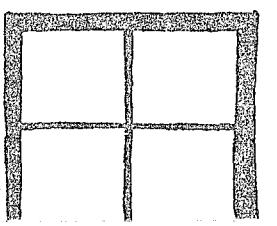
1. Look at this picture:



June is standing next to a . . . . . line.

John is lying on a . . . . . line.

2. Look at this picture of a window:

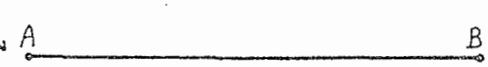


How many vertical lines are there? . . . . . .

How many horizontal lines are there? . . . . . .

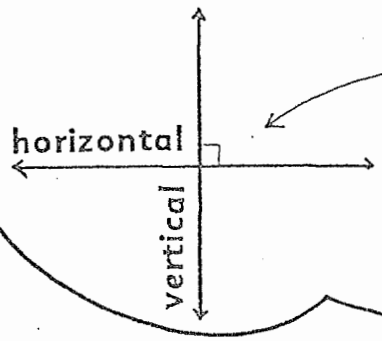
This horizontal line is called $\overleftrightarrow{AB}$.

This horizontal line is called $\overline{AB}$.



If you see arrows at both ends of the line, you write $\overleftrightarrow{AB}$.
If you see dots at both ends of the line, you write AB.

Sometimes, a horizontal line and a vertical line cross each other, like this.

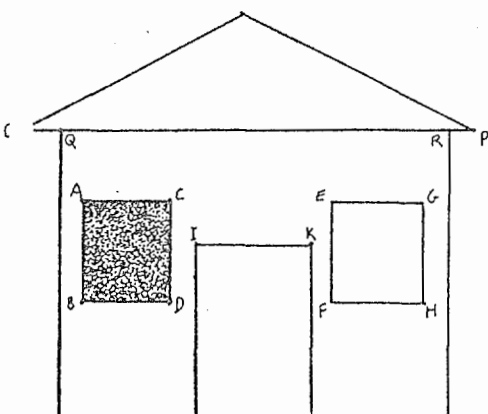


This little square shows that the lines cross each other at a **right angle**. A right angle is the shape you get when a horizontal line crosses a vertical line.

Look at the outer corners of this page. They are right angles.
Look at the corners of this square. ☐ They are also right angles.
When a horizontal line crosses a vertical line and makes a right angle, we say that the lines are **perpendicular** to each other!

Wow! Now you've learned some big words! Horizontal, vertical, right angle and . . . . . .
(You fill in the word).

Look at this picture of a house:



1. Is $\overline{OP}$ vertical or horizontal?
2. Is $\overline{QR}$ vertical or horizontal?
3. The door has two vertical lines. Write their names here: . . . . . .
4. How many vertical lines can you see in the dark window? . . . . . .
5. Look at the light window. What lines are **perpendicular** to $\overline{FH}$?

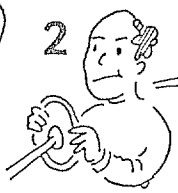
SIGNS of the TIMES

Have you noticed that when you go to a city, there are many signs everywhere? Signs help us and give us information. In the boxes below there are some people saying things and some signs. Can you match what each person is saying with a sign? Write your answers like this: .....1C.....

1

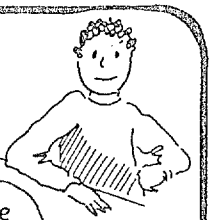
Oh! This shop closes at lunch! What a nuisance! We'll have to wait!

2



But we must get some petrol **somewhere**.

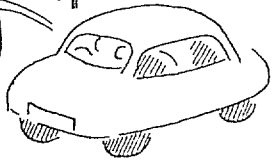
3



Well, I don't see any receptionist. Let's ring the bell.

O y another 80km and we'll be close to Table Mountain.

4



That door should not be locked, in case there is a fire.

5

6

Hey! This is a hospital! You're not allowed to do that!

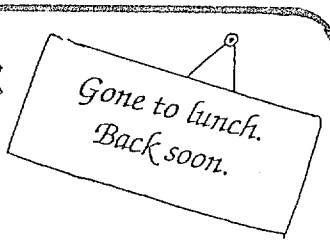
7

Gosh! Look at all that soap coming out of the machine!

A

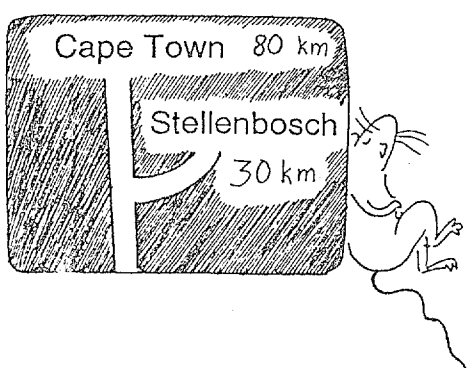
Write your answers in that tiny space below!

C

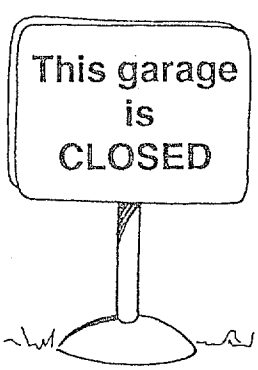


B

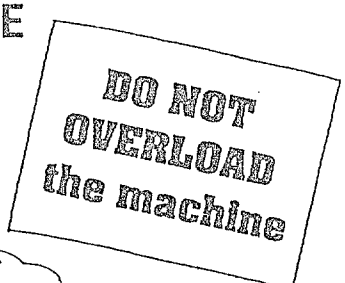
F



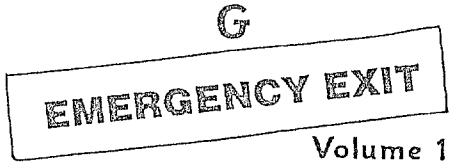
D

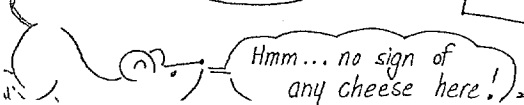


E

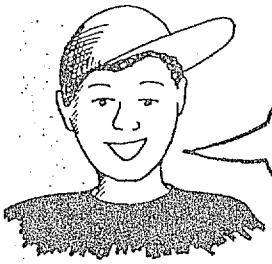


G





The Hiding Game



This is a game the whole family can play.

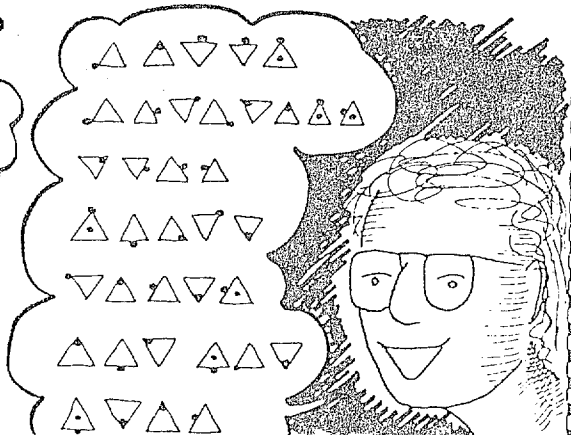
- Divide everyone into two teams.
- Give each team a name, like the Lions and the Zebras.
- Everyone looks around the room and tries to remember everything that is there.
- The Lion team leaves the room.
- The Zebra team hides something that is in the room.
- The Lion team comes back into the room and has to guess what is missing! If they guess right, they get one point.
- Next, the Zebra team leaves the room and the Lion team must hide something.

The team that gets the most points wins!

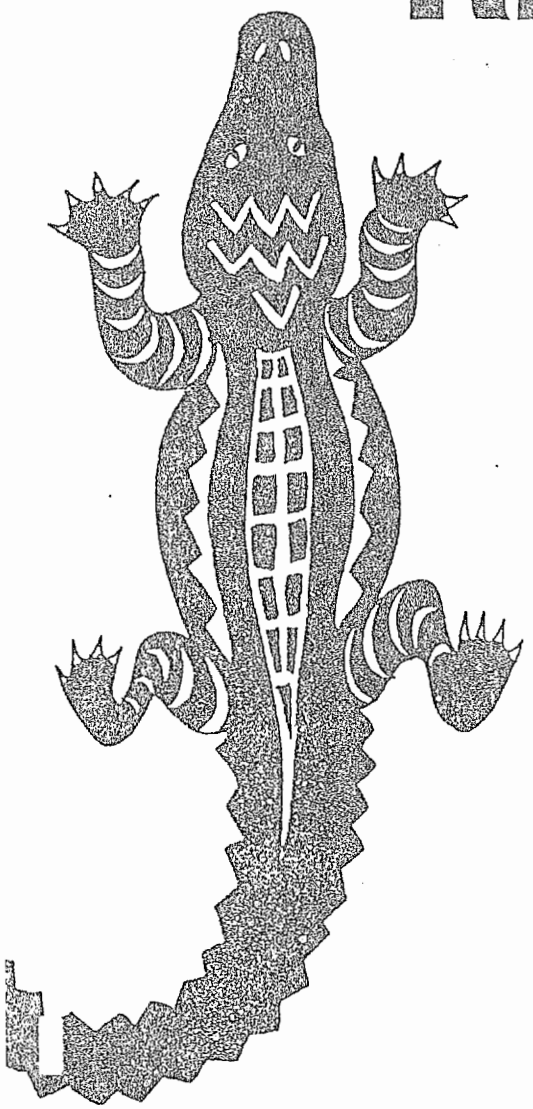
Can you guess what Uncle James is saying?

Uncle James has used a code to write his message. Can you work it out? Each shape stands for a letter of the alphabet, e.g. △ = A, △ = B, etc.

A	B	C	D	E	F	G	H	I	J	K	L	M
△	△	△	▽	▽	▽	△	△	△	▽	▽	▽	△
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
△	△	▽	▽	▽	△	△	△	▽	▽	▽	△	△



RHYMES



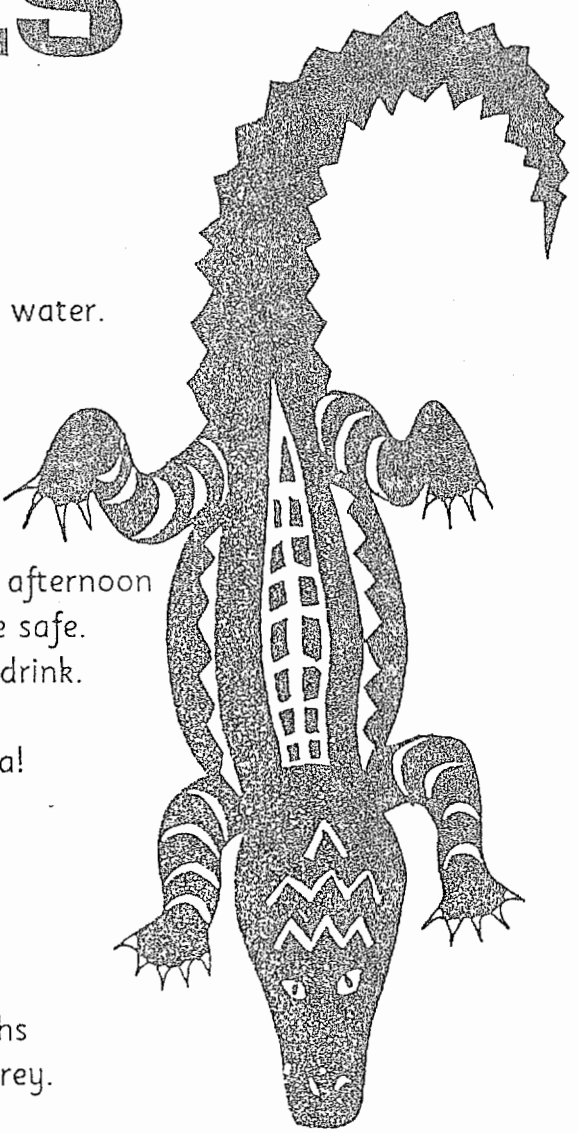
THE CROCODILE

The sly reptile lies
Log-like below the muddy water.
With hardly a ripple
She glides along.
Her nostrils and eyes
Are all we see.

In the warm peace of the afternoon
The impala think they are safe.
They bow their heads to drink.

But beware, gentle impala!
Beware the crocodile!

Powerful jaws snap.
Frantic legs thrash.
Scaly tail flicks.
Down to the brown depths
The crocodile takes her prey.



QUESTIONS FOR YOU!

1. The crocodile is a reptile. Write down the names of two other reptiles.
   .....

2. Would you like to go for a swim with a crocodile? .....
   Why? .....

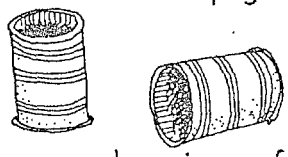
3. Why didn't the impala see the crocodile coming? .....
   .....

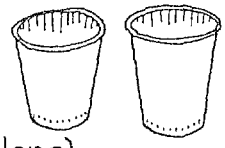
4. How many claws do crocodiles have on their back feet? .....

SOUNDS LIKE FUN!

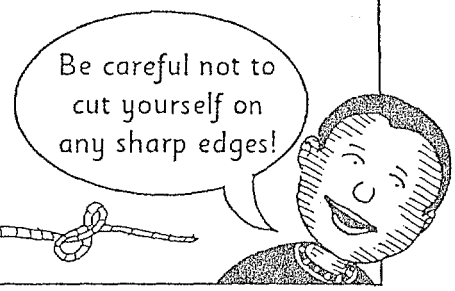
Here's a fun experiment to do with sound. Make yourself a telephone!

You will need: 2 empty tins *or* 2 plastic (or polystyrene) cups

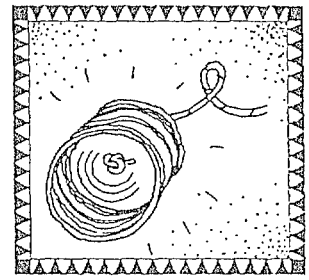




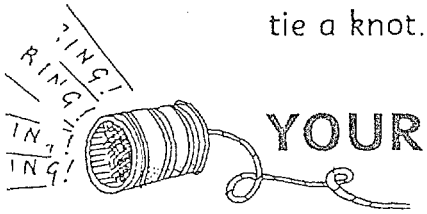
and a piece of string (up to 20m long).



What to do: 1. Make a small hole in the bottom of each cup (or tin).

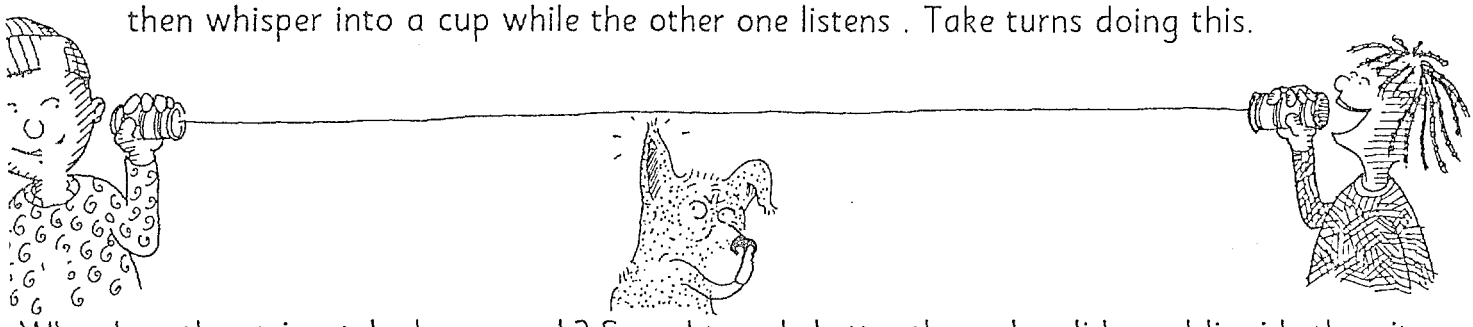


2. Push one end of the string through one of the holes and tie a knot. Do the same for the other end of the string.



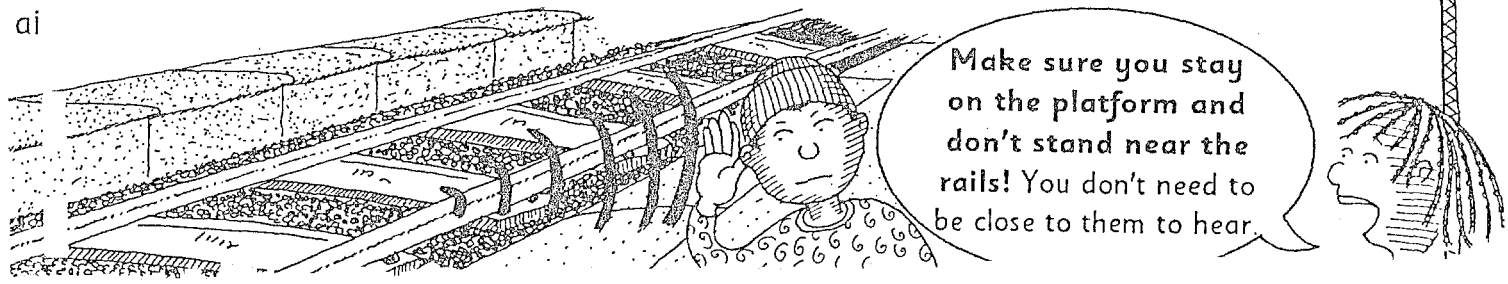
YOUR TELEPHONE IS NOW READY!

Stretch the string till it is tight and make sure it isn't touching anything. One of you must then whisper into a cup while the other one listens . Take turns doing this.



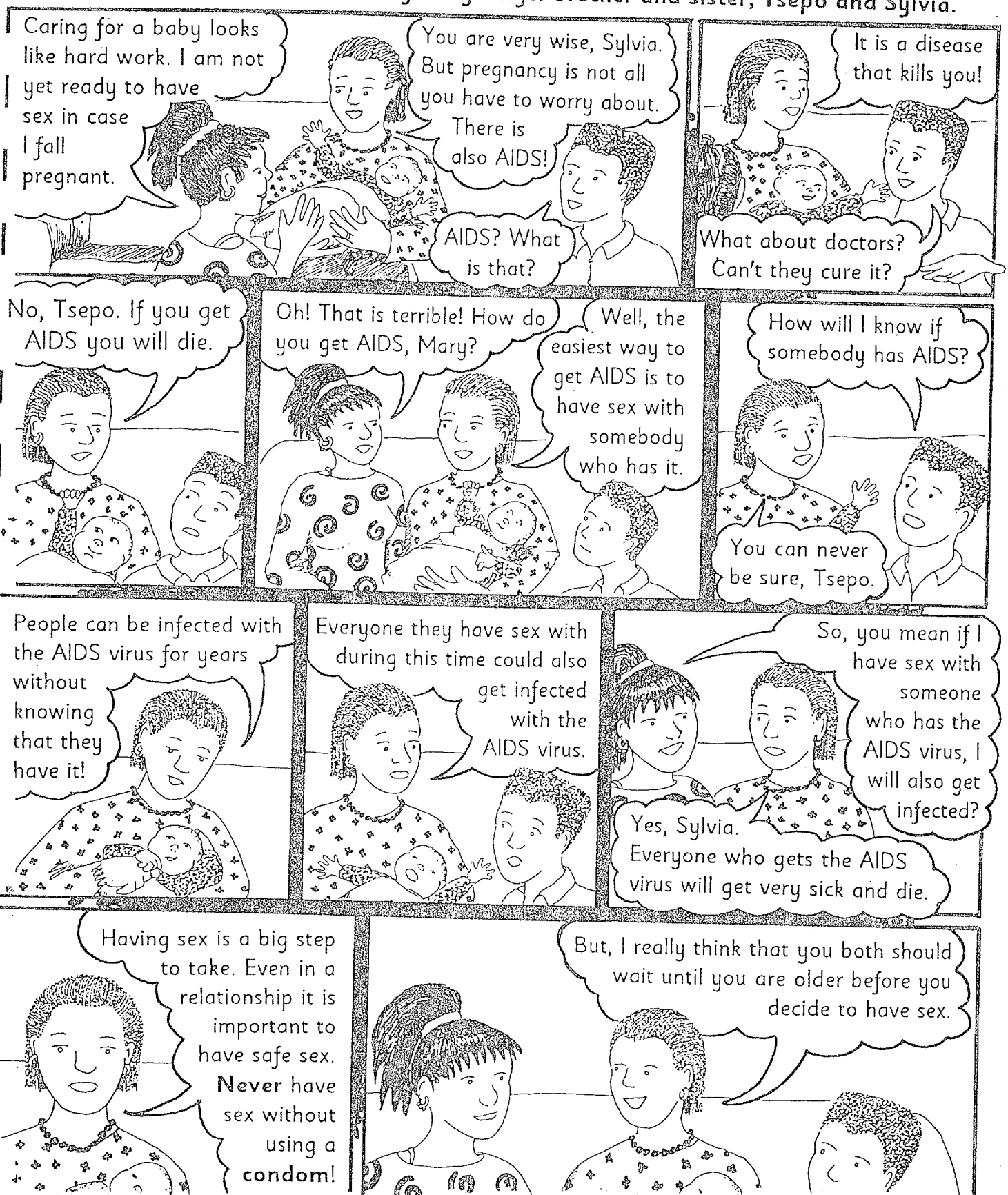
Why does the string telephone work? Sound travels better through solids and liquids than it does through air. Your telephone works because the sound of your voices is travelling along the solid string, instead of through the air.

At a train station, listen to the rails just before a train arrives. You will hear them hiss before you can hear the train. Sound travels faster through the solid rails than it does through the air.



What is AIDS?

Mary is married. She is visiting her younger brother and sister, Tsepo and Sylvia.



AIDS is a disease that kills. Anyone who has AIDS will die from it. There is no cure. That is why it is important to know the facts about AIDS.

WHAT CAUSES AIDS?

(Acquired Immune Deficiency Syndrome)

AIDS is caused by a virus. The virus which causes AIDS is called HIV (Human Immune Virus). When you have HIV in your body, we say that you are HIV positive. If the HIV virus makes you ill, we say that you have AIDS.

If you are HIV positive, you can look and feel very healthy for many years before you become sick with AIDS. If you have sex with **anyone** during this time they could get infected with the HIV virus. This means that they will get sick and die.

HOW WILL I KNOW IF I AM HIV POSITIVE?

You won't know if you are HIV positive because you won't look sick or feel sick. The only way to know if you are HIV positive is to have your blood tested. You can have this done at a hospital or clinic.

HOW CAN I GET AIDS?

The virus that causes AIDS lives in people's blood, men's semen and women's vaginal fluids. You can get the virus from:

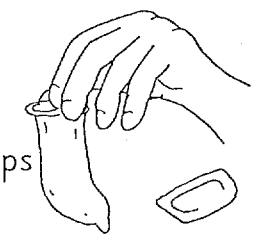
- having sex with someone who has AIDS, or who is HIV positive
- using a needle, syringe or razor blade that has been used by someone who has AIDS, or who is HIV positive
- having a blood transfusion, if the blood comes from a person who has AIDS, or who is HIV positive
- a pregnant woman who has AIDS, or who is HIV positive, can also pass the virus on to her unborn baby.

HOW CAN I PROTECT MYSELF FROM AIDS?

The usual way in which AIDS is spread from person to person is by having sex. But if the person you have sex with is **not** HIV positive and you and your partner don't have sex with **anyone** else, then you should be safe.

If you have more than one sexual partner, it is very likely you will get AIDS!

If you have sex, you must protect yourself by using a **condom**. This is a hollow tube of thin rubber which the man wears over his penis. A condom stops the AIDS virus (HIV) from passing from the boy to the girl, or from the girl to the boy. You can get free condoms at your nearest clinic. Ask someone there to explain to you how to use them.



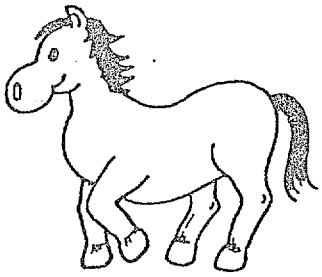
Thank you for telling me this, Mary. Now I see

Appendix C:

Phase I and II Data Collection Instruments

Phase I Data Collection Instruments

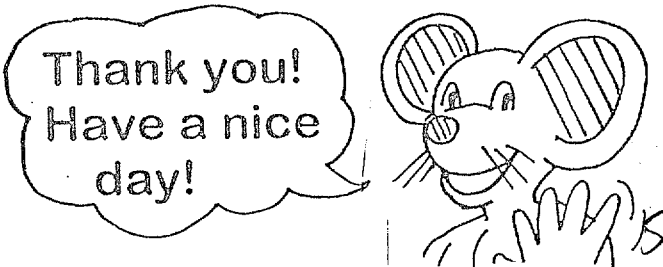
This is a horse.



This is a girl.

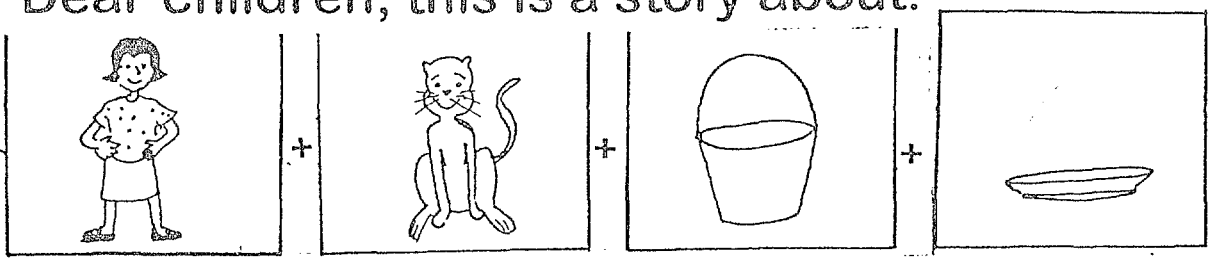
This is a boy.

Now, help Einstein Mouse . Draw <u>ten</u> other drawings of horses, boys and girls here.



Uncle James says .....

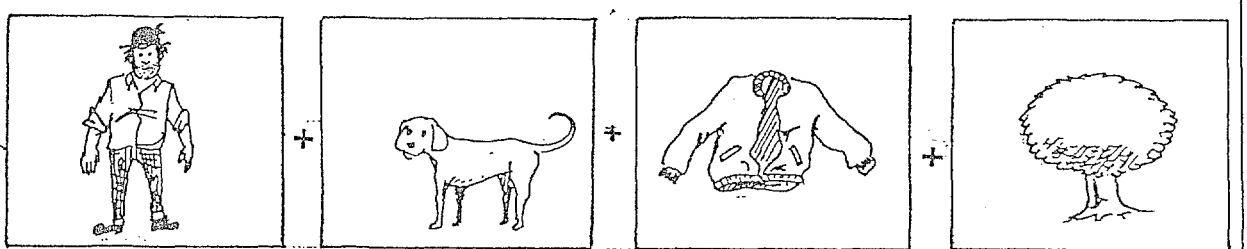
Dear children, this is a story about:



a girl + a cat + a bucket + a saucer of milk

Do all girls love cats? I don't know, but I know a girl who loves cats very much. One day she walked in the street and she heard "meeow, meeow" very softly. She looked down the street. She looked behind a wall. She looked around a corner. She saw nothing! Then she saw an upside-down bucket. She lifted it up. Under it sat a cat! "Oh, you poor cat," said the girl. "You were trapped!" Come home and I'll give you a saucer of milk! And so the cat stayed with the girl for the rest of its life.

Now please write your own story about:



a beggar + a dog + a jacket + a tree

Your own story:

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

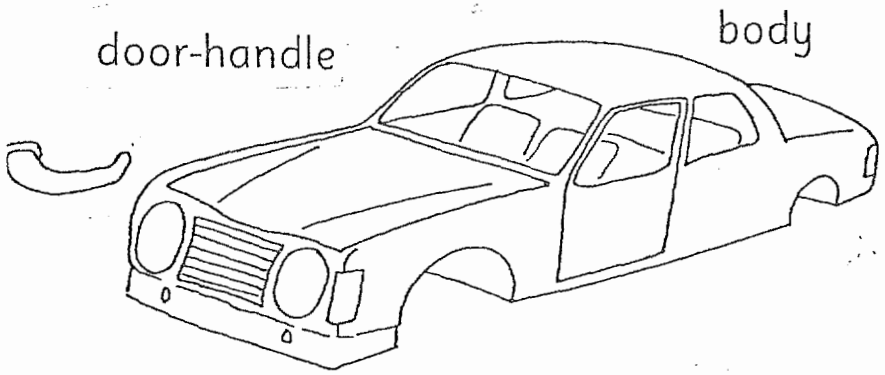
.....

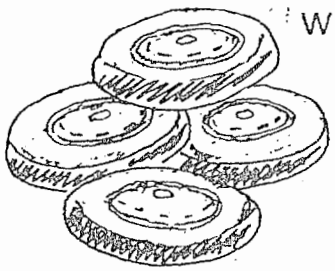
.....

My name is: .....

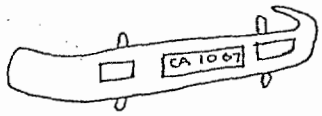
I am in ... to day

Drawing with Suki...

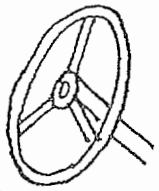




side mirror



bumper



steering wheel

Draw a picture of this car:

Side

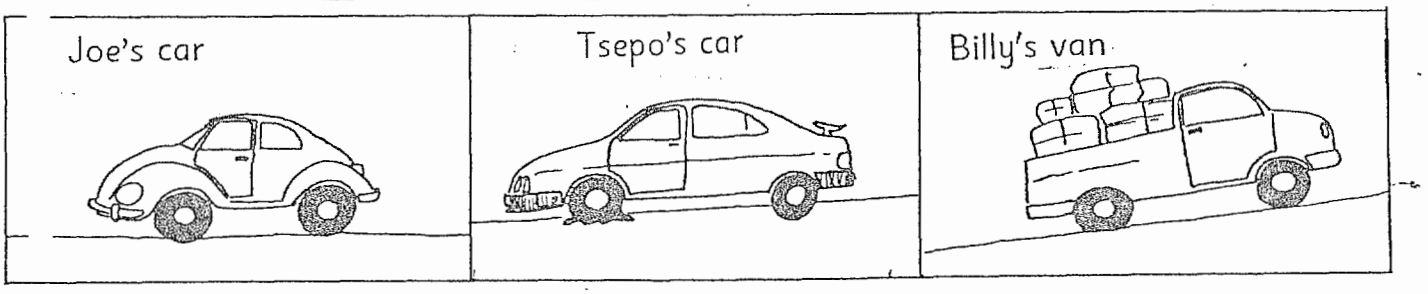
rom the side,

Front

and from the front. Thank you!

Suki wants to know:

Which car will go fastest?

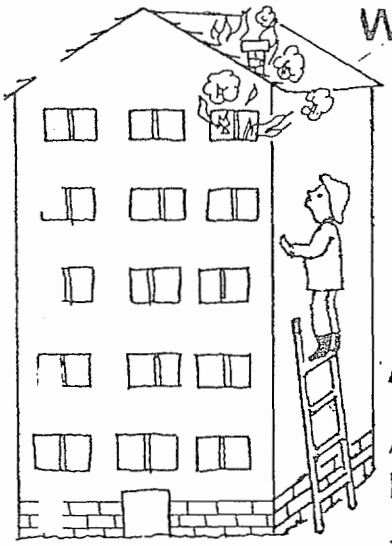


Answer: ..... Why do you think so? .....

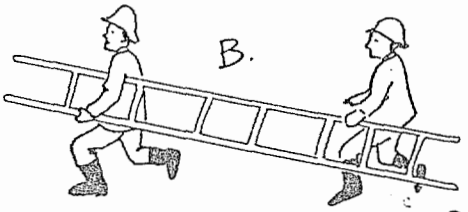
.....

.....

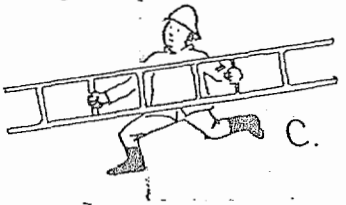
Which ladder will get you to the roof of the house?



A.



B.



C.

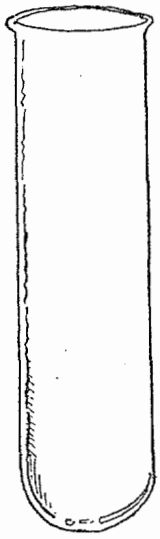
D.

Answer: .....

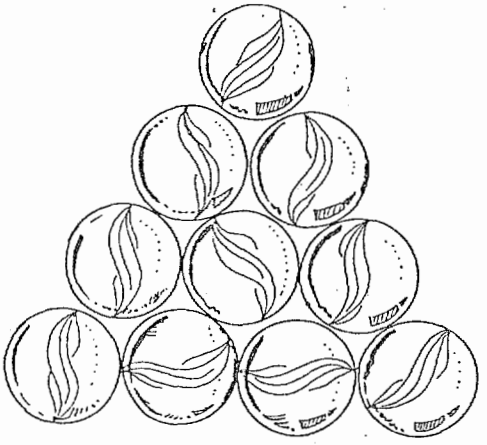
How do you know? .....

.....

.....



This is a glass test tube.



This is a heap of marbles.

This is the real size of the marbles and the glass test tube. How many marbles can you put inside the tube? Answer: .....

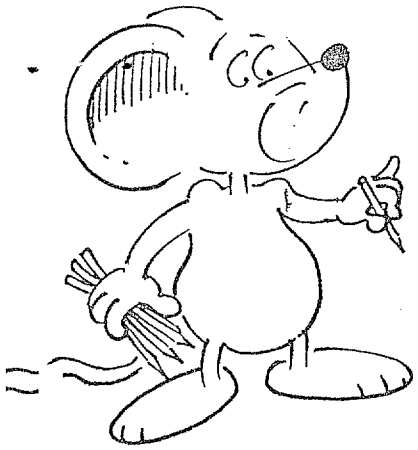
How do you know? .....

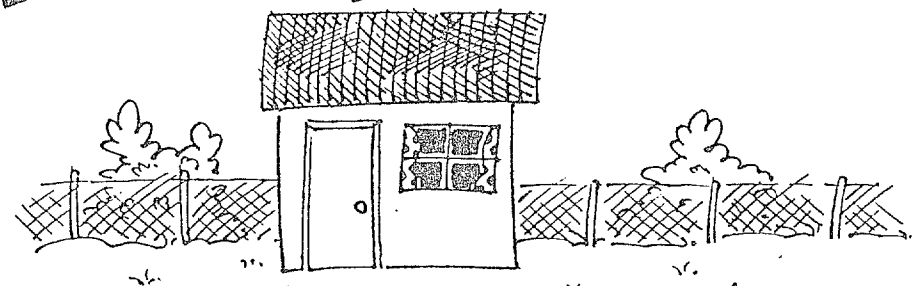
.....

6c

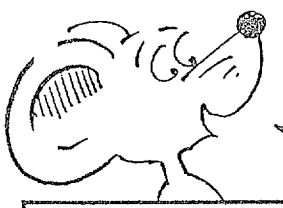
Phase II Data Collection Instruments

Draw with Einstein Mouse!



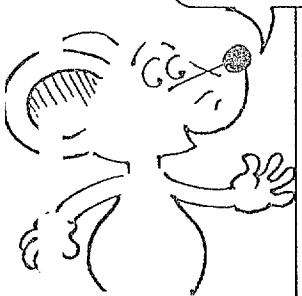


This is a house.



Now, help me. Draw a **bigger** house in a beautiful garden.

Thank you! Please write your name, your age, your standard and the name of your school in this block.



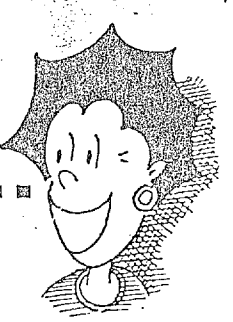
My name is: .....

My age is: .....

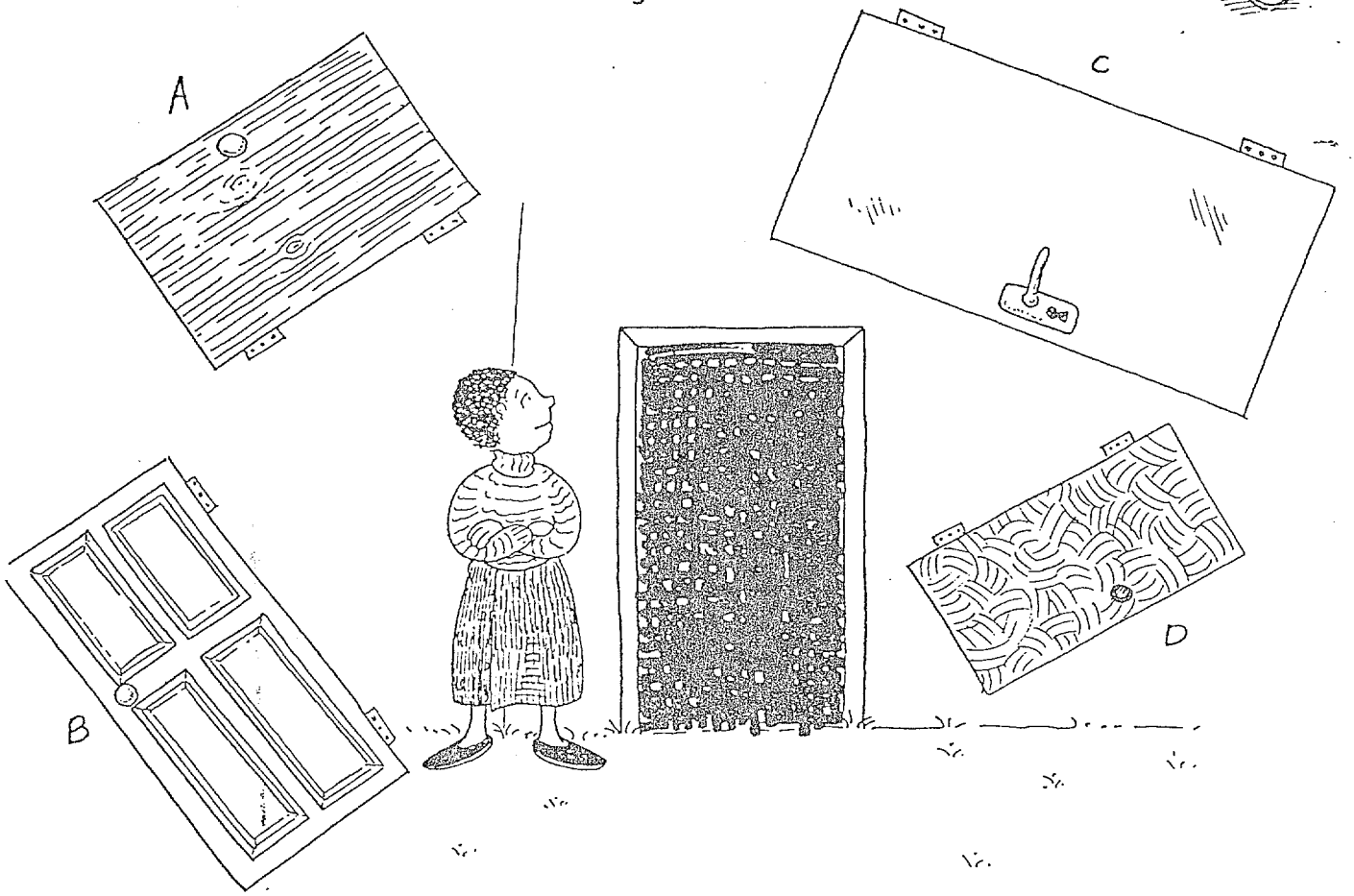
I am in standard: .....

My school is: .....

SUKI WANTS TO KNOW...



...which door must the woman use for her house?

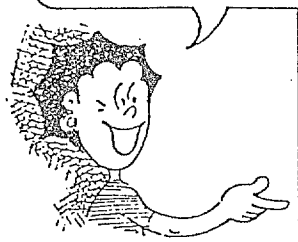


Answer:..... How do you know? .....

.....

.....

Please fill in this block when you have finished.



My **name** is: .....

My **age** is: .....

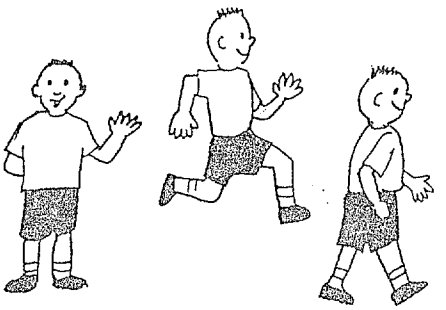
I am in **standard**: .....

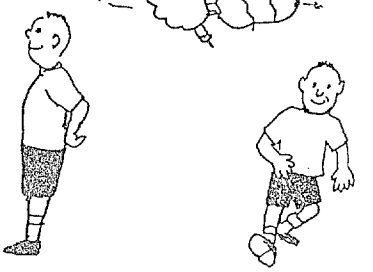
My **school** is: .....

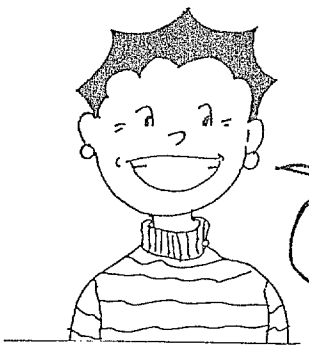
63

Drawing with Suki

Here are pictures of a boy doing different things:







Now, draw pictures of this girl:

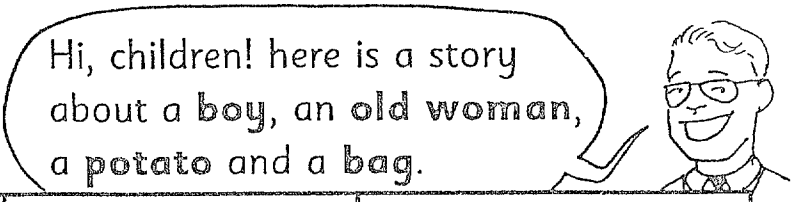
from the side	from the front

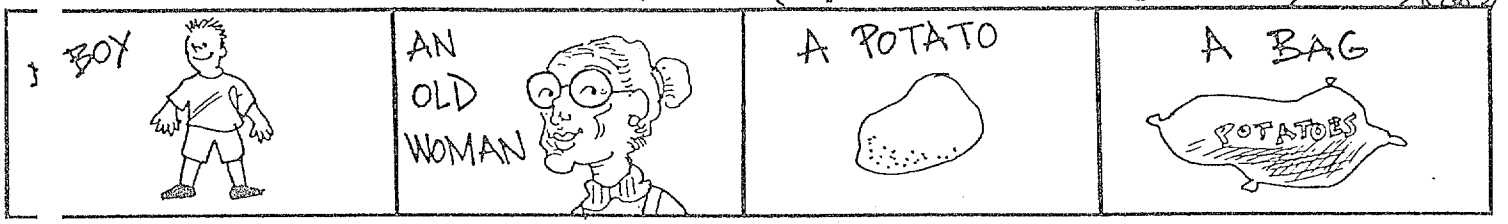
Please fill in this block when you have finished.

My name is: .....

My age is: .....

Write a story!



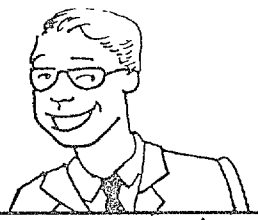


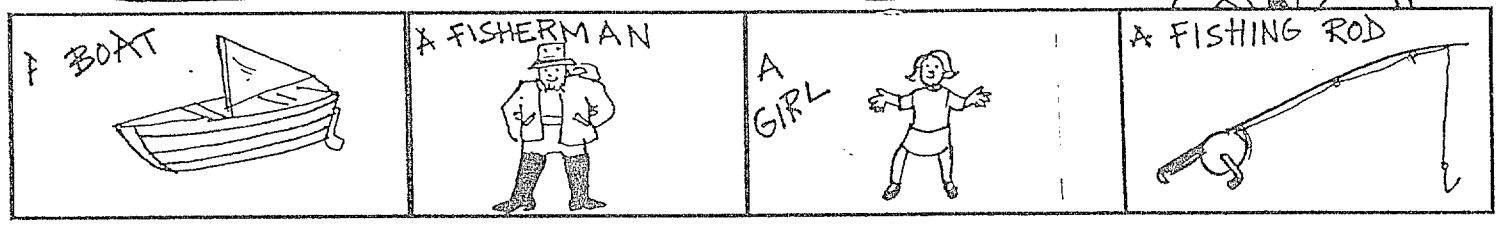
A boy was walking home one day. It was a cold, rainy day and he was feeling hungry. "I wonder w at we will have for supper tonight", Just then he saw a brown shape. "That's strange", he thought, "there's a potato lying on the pavement". He picked it up and put in his pocket.

H walked on and he saw another potato, and another, and another. He picked them all up. His pockets were getting full. Then he saw an old woman carrying a bag of potatoes over her sh oulders. There was a hole in the bag and the potatoes were falling out.

T e boy ran ran up to her and gave her all the potatoes. "Thank you, child", she said. She was so glad that she gave him three large potatoes. "Now I know what we will have for supper", he said, "f ash potato and sausage!"

Now here's a chance to write a story of your own. Write a out a **boat**, a **fisherman**, a **girl** and a **fishing rod**.





My Own Story

I n in **standard**: ..... My **name** is: .....

Appendix D:

Criteria for Scoring

CRITERIA FOR SCORING

ENGLISH				
Inadequate	**Poor**	**Competent**	**Very Good**	**Outstanding**
1	2	3	4	5
* Not followed instructions	* Followed some instructions	* Followed most instructions	* Followed all instructions	* Followed and went beyond instructions
* No originality	* Very little originality	* Some originality	* Most original	* Complete originality
* Meaning unclear	* Meaning vague	* Meaning partly clear	* Integrated thought, some difficulties with expressions	* Clearly integrated and expressed thoughts
* No punctuation	* Inappropriate punctuation	* Some punctuation	* Well formed sentences and good punctuation	* Well planned and presented response

GRAPHICACY				
Inadequate	**Poor**	**Competent**	**Very Good**	**Outstanding**
1	2	3	4	5
* No originality	* Very little originality	* Some original thinking	* Mostly original thinking	* Complete original thinking
* Unclear expression	* Poor expression	* Expression reasonably clear	* Little difficulty with expression	* Clear expression
* No understanding of graphics or their interpretations	* Poor graphic perception	* Able to relate graphics to text	* Good grasp of graphical perceptions	* Comprehends and assimilates graphical perceptions
* No graphic details	* Very few graphic details	* Some details	* Good graphic details	* Excellent graphic details - beyond what is asked for

PROBLEM SOLVING				
Inadequate	**Poor**	**Competent**	**Very Good**	**Outstanding**
1	2	3	4	5
* Has not understood the problem	* Vaguely understood the problem	* Identified the problem	* Correctly identified the problem	* Correctly identified the problem
* Did not understand any of the rules	* Understood very few of the rules	* Understood some of the rules	* Understood most of the rules	* Understood all the rules
* No evidence of logical thinking	* Very little evidence of logical thinking	* Some evidence of logical thinking	* Clear evidence of logical thinking in most categories	* Clear evidence of logical thinking in all categories
* Outcome has no bearing on problem and no reasoning	* Incorrect outcome and wrong reasoning	* Correct outcome but not necessarily right reason	* Correct outcome and reasoning	* Correct outcome and reasoning

Appendix E

Statistical Analysis

English Proficiency

Interaction between ESST/non-ESST and Time and Region

	SS	DF	MS	F	p
ESST/non-ESST	38.15	1	38.15	48.9	0.00
Region	19.97	2	9.98	12.80	0.00
ESST/non-ESST by Region	21.14	2	10.57	13.55	0.00
Time	35.84	1	36.84	85.17	0.00
ESST/non-ESST by Time	11.43	1	11.43	26.42	0.00
Region by Time	26.68	2	13.34	30.84	0.00
ESST/non-ESST by Region by Time	2.23	2	1.12	2.58	0.078

Interaction between ESST/non-ESST and Time and Gender

	SS	DF	MS	F	p
ESST/non-ESST	32.81	1	32.81	34.9	0.00
Gender	3.62	1	3.62	3.85	0.05
ESST/non-ESST by Gender	1.7	1	1.7	1.8	0.18
Time	33.5	1	33.5	59.13	0.00
ESST/non-ESST by Time	6.4	1	6.4	11.3	0.00
Gender by Time	0.05	1	0.05	0.10	0.76
ESST/non-ESST by Gender by Time	0.00	1	0.00	0.00	0.98

Problem Solving

Interaction between ESST/non-ESST and Time and Region

	SS	DF	MS	F	p
ESST/non-ESST	7.5	1	7.5	10.8	0.00
Region	9.89	2	4.9	7.1	0.00
ESST/non-ESST by Region	26.11	2	13.1	18.8	0.00
Time	19.18	1	19.18	28.5	0.00
ESST/non-ESST by Time	11.4	1	11.4	28.5	0.00
Region by Time	27.8	2	13.9	34.7	0.00
ESST/non-ESST by Region by Time	6.71	2	3.36	8.39	0.00

Interaction between ESST/non-ESST and Time and Gender

	SS	DF	MS	F	p
ESST/non-ESST	5.5	1	5.5	6.6	0.11
Gender	2.8	1	2.8	3.34	0.07
ESST/non-ESST by Gender	0.04	1	0.04	0.05	0.80
Time	17.5	1	17.5	30.1	0.00
ESST/non-ESST by Time	5.5	1	5.5	9.5	0.002
Gender by Time	0.00	1	0.00	0.01	0.90
ESST/non-ESST by Gender by Time	0.60	1	0.26	1.00	0.30

Graphicacy

Interaction between ESST/non-ESST and Time and Region

	SS	DF	MS	F	p
ESST/non-ESST	6.1	1	6.1	8.9	0.00
Region	36.22	2	18.1	26.47	0.00
ESST/non-ESST by Region	12.34	2	6.17	9.02	0.00
Time	14.30	1	14.30	39.10	0.00
ESST/non-ESST by Time	5.66	1	5.66	15.47	0.00
Region by Time	7.93	2	3.96	10.84	0.00
ESST/non-ESST by Region by Time	2.5	2	1.25	3.42	0.03

Interaction between ESST/non-ESST and Time and Gender

	SS	DF	MS	F	p
ESST/non-ESST	2.1	1	2.1	2.3	0.13
Gender	0.51	1	0.51	0.57	0.45
ESST/non-ESST by Gender	0.00	1	0.00	0.00	1.0
Time	14.9	1	14.9	35.37	0.00
ESST/non-ESST by Time	3.4	1	3.4	8.1	0.005
Gender by Time	0.04	1	0.04	0.10	0.75
ESST/non-ESST by Gender by Time	0.28	1	0.28	0.67	0.41